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NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 180

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CONTENTS

DISCUSSION OF URANIUM MARKET, STATUS OF LOCAL MINES

Sydney THE SYDNEY MORNING HERALD in English 9 Dec 82 pp 13, 15

[Article by David Uren]

[Text]

Pan Continental's chairman, Mr Tony Grey, is an optimist — to survive in the uranium industry you have to be.

"Most forecasts are pointing to an upturn later in this decade with a vigorous demand emerging in the 1990s," he told the company's long-suffering shareholders at the annual general meeting last week.

He said he would be very surprised if the company did not clinch some long-term contracts for its Jabiluka project before the end of next year.

Jabiluka is one of half a dozen uranium projects in Australia looking for a place in the market. There is a similar number of projects in Canada and a few dotted elsewhere around the world.

Jabiluka is the richest but it may not be the first to get going.

The uranium market is like no other. The power utilities are expected to buy 48,000 tonnes of uranium this year, of which they will use only 25,000 tonnes.

Locked into long-term contracts, they will add the rest to their stockpiles — which already amount to about 150,000 tonnes.

The uranium broker, Nuexco, has forecast that the nuclear reactors under construction at present will bring supply and demand into balance at about 50,000 tonnes each by 1990. By then, however, stocks will be 50 per cent higher than they are now.

It is a tough market to crack.

Some chinks are provided by the closure of some American mines and the expiry of some existing contracts but otherwise it is a matter of waiting around until reactors under construction come on stream.

In practice, the Australian projects cannot hope to gain many American contracts because of the minimum export price of $33 a pound set by the Government. American mines are closing because utilities realise they can now get uranium much cheaper than this.

The Canadian Keylake project, for example, has been offering its uranium for as little as $US26 a pound, while spot prices have fallen as low as $US17 a pound (though Mr Grey believes a recent 50c) a pound rise in the spot price may mark the bottom of the market).

The French are the only buyers interested in quantities big enough to justify a start to any of the Australian projects.

Reactors under construction there are likely to raise the country's uranium requirements from 2,300 tonnes a year to 7,600 tonnes a year by the late 1980s. A French buying mission visited Australia this year.

Japanese utilities may also enter the market in the next year or two.

Mr Grey told shareholders that Pancontinental was aiming to enter the market at the time the utilities were expecting demand to pick up.

He said it would be unwise for the utilities to procrastinate about entering fresh long-term contracts as they would only pay more dearly in the end.

All the other projects are seeking to enter the market at around the same time. Their problem is that not only are they competing against each other, they are also competing against the utilities' enormous stockpiles.

Nuexco says there was 7,600 tonnes of stockpiled uranium available for spot sale this year. It expects the market to take only 450 tonnes.

The utilities could decide to defer decisions about fresh long-term contracts for several years and meet their requirements from inventories. If they do, the projects most likely to get off the ground are those with the shortest lead times.

Ranger, in the Northern Territory, is considered by many to be the one most likely. The mine is already a hugely profitable operation, churning out 3,000 tonnes of yellowcake a year.

Energy Resources of Australia, which owns the mine, could readily crack its output up to 4,500 tonnes a year with minimum investment. Most of the plant could absorb that level of production without modification. Output could be lifted to 6,000 tonnes a year with the expenditure of little more than $50 million.

Jabiluka, by contrast, would take an investment of $650 million to be developed from scratch. This could not be contemplated without sales contracts covering at least 3,400 tonnes a year settled beforehand.

This would require perhaps half a dozen contracts being lined up before any one of them could be settled. This is not out of the question — Pancontinental has hired some of the best marketing

people in the trade and it has a very high-grade deposit — but it is a formidable task.

The Jabiluka project still needs to sort out its equity before it can go ahead. AT present, Pancontinental has 65 per cent and Getty Oil has 34 per cent.

Getty Oil must reduce its interest to 25 per cent, selling the remainder to Australians. This should be easy if contracts are secured but it does mean that the partners are unable to offer any equity as a sweetener to prospective buyers.

Western Mining's Yeelirrie has some advantages in this respect. WMC has 75 per cent of the project, and Urangesellschaft has 10 per cent, leaving 15 per cent on the market following the decision of Esso in May this year to pull out of the project.

WMC is talking to a potential customer about taking up Esso's stakes and hopes to have this settled by next March. Besides its ability to offer equity, Yeelirrie also has an advantage over Jabiluka in requiring a smaller base load to get started.

The $360 million Yeelirrie project could probably be developed once it had contracts covering 1,750 tonnes a year. Its eventual output is 2,500 tonnes a year.

Roxby Downs, also in the WMC stable, could also seek a start late in the decade. WMC is probably keen to get Yeelirrie going first but, if that is success it may seek contracts for between 1,000 and 1,500 tonnes of uranium oxide a year to get the giant Roxby copper-uranium-gold project started.

Eventually Roxby Downs would produce about 4,800 tonnes of uranium a year.

Outside these four projects, there are a large number of uranium deposits in Australia with only remote chances of development.

Koongarra is adjacent to the Ranger deposit in the Kakadu National Park and could share much of Ranger's infra-structure. It is 100 per cent owned by Denison Mines, which is one of Canada's biggest uranium miners. Denison bought the deposit from Noranda two years ago.

Denison knows the uranium markets and could probably arrange buyers for Koongarra uranium but it would have difficulty selling 75 per cent equity in the project to Australian buyers at a price which would give an adequate return on its investment.

Ben Lomond, near Townsville, is owned by Minatome — a partnership of Total and Pechiney — which is a major uranium buyer. It is doubtful, however, that the French company would regard it as a low-cost deposit and local partners would have to be found.

Lake Way in Western Australia was generating some excitement two years ago when Delhi, its 100 per cent owner, was looking for local equity. The equity problems were resolved following Delhi's takeover by CSR but the project is now very low on CSR's pecking order.

Honeymoon in South Australia is CSR's main uranium interest.

It is a pilot project aimed at testing the solution-mining technique requiring a lot of technical work before a full-scale mining project could be considered. CSR has 25 per cent and MIM 49 per cent.

CSO: 5100/7515

BRISBANE AREA SAID TO LEAD IN URANIUM PLANT COMPETITION

Brisbane THE COURIER-MAIL in English 13 Dec 82 p 2

[Text]

Queensland was left as the only site being considered for the construction of a uranium enrichment plant following Labor's South Australian election win, the Opposition Leader, Mr Wright, said yesterday.

Mr Wright said the near Brisbane sites of Beaudesert and Caboolture were now certain to attract closer attention.

If so, the Queensland Government should honor its pledge to give local residents an adequate chance for talks before a final decision.

"In October, the Federal Government approved plans by the Uranium Enrichment Group of Australia to build a plant, to cost at least $1000 million," Mr Wright said.

"The group, made up of CSR Ltd, Broken Hill Pty, Western Mining, and Peko Wallsend, had sites near Caboolture, Beaudesert and Adelaide on its short list.

"This plant has met with the combined opposition of the trade union movement and the overwhelming majority — 88 percent — of Caboolture residents.

"Yet this Government, and most notably the Premier, Mr Bjelke-Petersen, is falling over itself to ensure the uranium enrichment plant proposal becomes a reality," he said.

Mr Wright said residents of the selected area should have an input into the plant construction, if it went ahead, and an assurance that their majority opinion would be acknowledged properly.

"This is just another example of the crying need in Queensland for a comprehensive land use study to determine suitable sites for particular industries," Mr Wright said.

"The enrichment plant is another example of attempts to establish industries incompatible with the near Brisbane locations suggested for them.

"Bribie Island has already been considered for a pulp mill and coal loading port."

CSO: 5100/7515

BRIEFS

NUCLEAR TARGET ISSUE--The Government believes there is no identifiable threat of major attack against Australia by regional countries or the Soviet Union for the next 10 years. The Minister for Defence, Mr Sinclair, told Parliament yesterday that lower level threats were "improbable," but the defence forces were increasing their preparations against these "lesser contingencies" in the north and west of the continent. Mr Sinclair's statement was the Government's response to the report of the joint parliamentary committee on foreign affairs and defence, Threats to Australia's Security, which was presented to Parliament last year. Only four MPs were in the House to hear Mr Sinclair's speech: Mr Robert Katter (NP, Qld), who chaired the sub-committee that prepared the report, Mr Scholes, Mr William Morrison (ALP, NSW) and Dr Neal Blewett (ALP, SA). While Mr Sinclair agreed with the main findings of the Katter report, he took issue with the points it made about US bases in Australia. The report said the three main bases, at North West Cape, Pine Gap and Nurrungar, made Australia a nuclear target in the event of a Soviet-American war, and that hosting the bases was not necessarily part of the ANZUS obligations. He said: "The Government considers that the incremental risk of nuclear attack which might attach to the hosting of these facilities is small, and it rejects any proposition that Australians should avoid helping to deter nuclear war if our contribution involves some element of risk." [By William Pinwill] [Excerpts] [Canberra THE AUSTRALIAN in English 15 Dec 82 p 24]

CSO: 5100/7515

HUNGARY'S NUCLEAR POWERPLANT FROM INCEPTION TO ON STREAM

Budapest NEPSZABADSAG in Hungarian 24 Dec 82 p 8-9

[Article by Katalin Bossanyi (text) and Laszlo Miko (pictures)]

[Text] The startup process of the operation of Unit No 1 of the Paks nuclear power plant reached its final phase. Electric power generation is expected to begin during the last days of the year. Paks is the 267th nuclear power plant in the world, and through it Hungary has become a member of the "atomic club" of countries which are taking advantage of the greatest, and at the same time the most dangerous, scientific and technical potential of our era exclusively for peaceful purposes.

Shutdown and Resumption of the Project

This noteworthy event requires a retrospective review. In 1965 the Soviet Union initiated the Druzhba (Friendship) plan for the development of a chain of nuclear power plants in the CEMA (Council for Mutual Economic Assistance) countries. In 1966 we were among the first to conclude an agreement for the construction of two 400-megawatt blocks, to be completed by 1975. The Soviet Union contracted for a nearly complete turnkey delivery; after transmission of the technical plans, preparation of the terrain was started in 1968. However, from the very beginning the development efforts were characterized by a certain amount of hypocrisy, since at that time petroleum was still quite inexpensive. Therefore, in 1970 for economic considerations we stopped the development effort and proposed postponing the project until the eighties. With hindsight--taking the repeated explosive increase of the price of oil into account--this was not a wise decision.

Discussions concerning resumption of the work were started in 1973. The first construction plans were obtained during the middle of 1975 and at that time the foundation was laid at Paks. 1980 was the deadline for the construction of the first block. However, this renewed startup involved a change in the roles.

Construction of the Paks nuclear power plant is based on a multilateral agreement of the CEMA countries involving specialization of production. This means that various main components are supplied by different fraternal countries. (This change in the preparatory effort caused some delay during

the construction). However, the most important change resulted from the new safety system developed by the Soviet research and development engineers while the project was under way. In this sense the Paks nuclear power plant, with its multiple protective system, is considered a prototype, even though its basic structure is in operation in many places. It is easy to understand that the stricter safety requirements presented new tasks for the Kiev designers. The new design is estimated to have increased the time, material and labor requirements of the first unit by about 50 percent.

Construction at a more vigorous rate was started in 1977. We found out very rapidly that we were not sufficiently well prepared for the new task from the technical and quality-control viewpoint. The accumulating problems resulted in intervention by the central authority in 1978. The number of construction workers was increased: 10 companies of soldiers and a group of Polish welding experts were sent to the site. A new working system was initiated and preferential wage rates and various administrative instructions were used to accelerate the rate of construction. At that time the representatives of the specialized ministries were designated and Benjamin Szabo was named commissioner of the government. Together with many of his co-workers, this leader, who lived through the anguish of the shutdown and resumption of the construction, worked tirelessly day and night from the very start, practically since 1967, without any consideration for his health or the tranquality of his family, to build a nuclear power plant in Hungary.

Let us interrupt the story at this point. In the next few weeks when we will celebrate the startup of the operation, we must keep in mind that in spite of the 2-year long delay, cost overruns and many worries, we are about to witness a special event which occurs only once in a lifetime. The nuclear power plant--the realization of which involved practically the whole Hungarian power industry--brings a new quality to the economic life of Hungary, and its coming into service can be justly called a new technical era. Therefore we are honoring wholeheartedly the 10,000 Paks workers who built the nuclear power plant.

Brilliantly Executed Installations

The turning point of the project occurred in 1979. From that time on the expenditures for the development work were increased every year by 8 billion forints. The two general contractors participating in the great effort--State Construction Enterprise No 22 and No 26--were supplemented by seven county construction enterprises, nicknamed "the seven dwarfs" by the Paks workers: from 1980 on the construction proceeded as scheduled. (And, according to Sandor Baranya, commissioner of the Ministry of Construction: Block No II has reached the stage of engineering assembly; specialized craftsmen are working on No III and the structure of No IV block is emerging.) On the other hand, in late 1980, troubles arose about the engineering assembly of the main building; the reactor fabricated in Czechoslovakia was delayed and the assembling and fabricating industry was faced by a novel task. Of the Hungarian companies the role played by the Factory and Machine Installation Enterprise deserves to be pointed out; their excellent technological achievements helped to moderate the delay. Thus, on 19 October 1980 when

the 250-ton crane fabriacted in the German Democratic Republic lifted and positioned the long awaited, excellent 216-ton reactor vessel fabricated by the Skoda Works, the welding work for the circulating pipes connected to the high-efficiency steam generators was completed and installation of the main components of the secondary circuit was also in an advanced state. Although procrastination was experienced at the main building, the Hungarian auxiliary installations, valued at several billion forints, were completed in time and in good quality. Therefore, Attila Lorinczi, commissioner of the Ministry of Machine Building was justified in saying: "In spite of the difficulties, we have every right to be proud of the achievement of the machine manufacturers and technical fitters, especially, because even though at the beginning, domestic industry seemed to be nearly completely excluded from the effort, our share has reached nearly 50 percent by now. As an example, the Ganz-Hungarian State Iron, Steel and Machine Factories obtained outstanding technical results with the manufacture of the cartridge loader: this specialized device is an important manipulator of the reactor core. The United Electrical Machine Factory was successful in further improving control technology. The list far from being complete, since 43 Hungarian machine builders participated in the Paks project."

But how about the outside appearance of the power plant? The 47-meter high main building containing two power plant blocks was built of steel cells filled with reinforced concrete. The following data will help to illustrate the dimensions: 160,000 cubic meters of concrete and 40,000 tons of structural iron were installed here. The weight of the engineering components amounts to 50,000 tons. To operate them, 380 kilometers of cables were laid, while the length of the weldments is 70 kilometers. The block consists of two, technologically separable parts: the secondary circuit, corresponding to the conventional power plants, and the primary circuit. The latter contains, among other components, the VVER-440 type reactor, the main circulating pumps and lines, also the steam generators.

Multiple safety

At this point the protection system, the embodiment of the new safety concept, should be mentioned. All of the components of the primary circuit containing radioactive water are made of thick-walled stainless steel, surrounded at the outside by hermetically sealed, steel-plated-covered, 1.5-meter thick reinforced concrete. This arrangement provides complete safety: at present the Paks nuclear power plant satisfies all safety requirements of an up-to-date nuclear power plant. Of course, the fears about nuclear power plants are not focused on the operation--the change of breakdown is insignificant--but on waste storage and environmental pollution. The burned-out fuel elements will be stored in special containers, under water within the Paks power plant for a few years, then they will be returned to the Soviet Union for reprocessing. The low-activity solid and liquid radioactive waste products will be disposed of in a burial ground especially developed for this purpose. The environmental control system, developed by the Central Research Institute of Physics, consists of 22 stations within the 33-kilometers perimeter of the power plant. According to international experience, living next to the nuclear power plant presents less risk than exposure to the background radiation during a flight or while watching color television.

At Paks, the last year was filled with the meticulous and technically exciting work of bringing the plant on stream; it was carried out by the staff members of the Paks Nuclear Power Plant Enterprise under the supervision of Soviet experts. The turbines were started with steam generated elsewhere on 3 November 1981; the pressure tests of the primary circuit were begun at the end of December, and cleaning of the system by circulation was completed on 20 January of this year. The first review was finished by the time of the hot run at the end of April. This meant that all of the components were taken apart and reassembled. The second review, followed by the hermetic leak-tightness examination represented a difficult test. Just imagine: the gigantic, reinforced-steel structure of the main building was subjected to superpressure of one bar and a half. There was great excitement followed by enjoyment of success at Paks.

However, the work could not be further accelerated even after that time: installation of the Soviet-built control system and programing of the computer required more problems than anticipated. Finally, the physical startup of the reactor began on 31 October; that is, the cartridge loader loaded 42 tons of enriched uranium into the reactor.

Just at the time of our visit on 14 December other critical events which affected decisively the startup operations, took place. At 12:40 pm the operator gradually started to remove the reactor control rod assemblies and at 3 pm reduction of the boric acid concentration of the system was initiated. By evening quite a few of us anxiously were crowded the control room--if you excuse us for this breach of the regulations. The atmosphere was tense; people were watching the instruments. Then, at 21:43, there was a flash on one of the display screens. "What happened?"--I asked Gabor Budai, reactor physicist, in charge of the operations. "The self-sustaining chain reaction has started" said he, adding for the benefit of the less expert people: "The reactor has started operations, the release of energy has been initiated." Assuming that everything is indeed in order, this means that by the end of this year thermal energy will be generated in the primary circuit, and within a few more days the parallel connection will be switched on: Paks will start generating electric power!

The Soviet Expert is Satisfied

After all this I was very much interested to find out what the head of the Soviet expert consultants, Ivan Vasilievich Prokopenko, thinks about the startup operation.

"All told, I am quite satisfied, especially with the work of the builders and installers. We suggested to our other partners that they come here because there is a lot to learn at Paks. The Hungarian components also operate well; it appears justified to increase their share in the course of the construction of the power plant. As far as the operation of bringing the plant on stream is concerned, we could have proceeded at a faster rate. The current rate was justified by lack of experience, since this is a first nuclear power plant, and by the additional tasks presented for us by the new safety system. However, I am convinced that there is nothing to prevent the startup by the end of the year".

Benjamin Szabo, state commissioner added: "All of the participants had to pay their tuition while the first block was under construction. For this reason, the subsequent blocks will be brought on stream at a faster rate, with a smaller investment in materials and labor and a better organized manner. We can expect that whole 1,760-megawatt power plant will be in full operation by 1987".

Tamas Zetner, director of production of the Hungarian Electric Works Trust gave us a few data to illustrate what all this signifies for the national economy. By 1985 the Paks nuclear power plant will supply 15 percent of the electric power requirements of the country, corresponding to 1.5 million tons of crude oil; this provides an opportunity for the saving or alternate use of $300 million. By 1990 the nuclear power plant will have an annual output of 11 billion kilowatt-hours, representing 22 percent of the domestic electric-power requirements.

Let us look ahead, toward the turn of the milleneum: "How will the domestic nuclear power plant construction program be modified by the year 2000; how will it be incorportaed into the combined strategy of energy policy?"--we asked Laszlo Kapolyi, Under Secretary of the Ministry of Industry, president of the state committee of the Paks nuclear power plant.

"The essence of the concept is, that--given the international division of labor and on the basis of the potential of the domestic coal resources--an energy production and consumption strategy will evolve, which within a few years will be able to moderate the energy-supply dependence and the vulnerability of our national economy and will reduce the phase lag in our adjustment to the continued changes of the world market. We have the unfavorable situation that at present 50 percent of our electric-energy generating capacity--moreover, the most up-to-date part--is based on hydrocarbon fuels. There is no need to explain further that burning the expensive hydrocarbons in the power plants, instead of using them for the production of more highly processed products, represents quite a waste. Therefore, in the future we must strive to develop our electric-energy generating system on the basis of nuclear fuels and coal."

As far as the long-range outlook of the power plant construction is concerned, it can be seen that for a long period of time we must reckon with a slower rate of economic growth and therefore the electric-energy consumption is growing at a more moderate rate than previously planned. According to our current calculations, until 1990 this growth will be covered by the 11 billion kWh production generated by the 1760-MW Paks nuclear power plant and the 2.4 billion kilowatt-hours imported from the Khmelnitsky nuclear power plant in the Soviet Union--built with Hungarian contributions to the construction costs--moreover, in view of the excess 3.5 billion kilowatt-hours, the electric energy generated in the hydrocarbon-fueled power plants can be also reduced.

Power Plant Construction until the year 2000

The problem is how to adapt the rate of development in the future, since during the period from 1990 until 2000 it will be necessary to bring on stream power plants with 3,500 megawatts of additional electric power generating capacity.

It appears desirable to solve the demand for additional thermal energy for fundamentally residential and communal use on the basis of domestic coal resources by building heating power plants, amplifying the so-called combined generation of heat and electric power. In the decisive districts, the larger share of the electric and remote-heat energy requirements of the capital, Miskolc, Gyor and Pecs can be supplied by the Eocene and Lias coal production programs currently in progress. As far as the development of the Western part of the country and Budapest is concerned, it must be taken into account that one of the units of Danubian Thermal Plant can be changed over with a relatively minor investment from the currently used petroleum to fueling with coal from the Many mine, and the Gyor power plant could be also enlarged in the same way. One thing is sure: if development of power plants for heating purposes is not started by the end of the eightes, the consumption of hydrocarbons for generating electrical energy will again grow by leaps and bounds. If we disregard the production of power plants for heating, we find that later on an about 3,000-MW capacity condensation-type power plant will be needed. If the investment and operating expenses are taken into account, the calculations do not reveal significant differences between the costs of electrical energy generated by coal-fired or nuclear-fuel-based power plants.

We should not rely on a "monoculture"--building only nuclear or only coal-fired power plants; moreover, it should be taken into account that at any given time our resources suffice to build only one plant. In view of the investment costs and time requirements of the construction it should be carefully considered whether to continue the enlargement of the nuclear power plant immediately after the four units at Paks have been brought on stream. All the more, because at the next stage we will be justified in building blocks with an output of 1,000-MW; at the end of the eighties and the beginning of the nineties there will be no need for such an increase in the electric power-generating capacity. Therefore, the startup of the operation of the next block of the nuclear power plant should be planned toward the middle of the nineties.

In parallel with this, the competent ministries are also studying the rentability of the coal-based power plants. In this connection, the Bicske mine and the tremendous lignite resources in the foothills of Matra and Bukk Mountains have been taken into consideration. Regardless which solution is adopted, the question of how to satisfy peak demands remains unanswered. The development of the storage-water hydroelectric plant at Predikaloszek might be an advantageous solution for this problem.

The deputy minister presented a tangible example to illustrate how these development stages are linked, how they cover the production methods and accelerate the restructuring of the processing industry to render it more competitive:

"The startup of the first Paks block cannot be measured simply by saving in crude-oil crude oil. The excess that does not have to be burned in hydrocarbon-based power plants, can be converted directly into raw materials to be processed at the Szazhalombatta catalytic cracking plant, which is scheduled

to start its operation next year. Together with the imports, we still will have 8.5 million tons of crude oil available to us; this means that from this same amount of oil we will be able to produce 10 percant more white-oil products, such as gasoline and gas oil. This significant modification of the production structure, valued at billions, will be followed in the years to come by the realization of the so-called "viscosity-breaking" technology, expected to yield an additional improvement of 5 percent. Similar structural modifications may be achieved in the energy consumption of the population, in transportation and in general, in a more up-to-date energy consumption of the infrastructure in the broader or narrower sense which is better adjusted to the current potentials.

Thus, confrontation of the extraction and processing branches of industry implies one-sidedness in economic policy and a senselss professional prejudice. Actually, they represent successive stages of development which are indispensable to each other. This is why Paks is a promising stage of the complex interpretation of the long-range industrial policy.

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CSO: 5100/3009

NUCLEAR ENERGY DEVELOPMENT, CONSTRUCTION PROBLEMS DESCRIBED

Warsaw ZYCIE GOSPODARCZE in Polish No 3, 16 Jan 83 pp 1, 4

[Article by Wlodzimierz Wodecki: "The Nuclear Mess"]

[Text] In a recently published PAP interview Dr Mieczyslaw Sowinski, chairman of the State Atomic Energy Agency, made the following statement among others: "...serious barriers have already emerged which prevent the further growth of power engineering systems based on the burning of hard and brown coal and oil.... It is the fate of Europe, and Poland as well, to move ahead with the development of the nuclear power industry. To put it simply, there is no other way out for us. After 1990 the nuclear power industry may be our only principal new resource for balancing our energy budget."

It needs to be said in addition that every 1,000 MW of on-line generating capacity in conventional power plants means that it is necessary to fire boilers with an annual volume of at least 3 million tons of coal, and the consequences of using this kind of fuel are thousands of tons of slag and ash and the emission of dust and many toxic substances into the atmosphere. So, it is not hard to imagine what kind of future would be in store for our country and its ecology if our entire power industry continued to rely on conventional fuels. The alternative to coal is nuclear fuel, which to be sure has many opponents among members of the "Greens" [environmental activists].

People started to think about the development of a nuclear power industry in Poland at the start of the 1970s. Let us recall that 1982 was in fact selected as the target date for the startup of our first nuclear power plant in Zarnowiec. In the meantime, though, work proceeded on the expansion of energy-intensive industries such as metallurgy, cement plants, chemical industries, and certain raw materials extraction and processing industries. The neglect of the development of the power industry culminated in a severe energy crisis at the height of the fall-winter season of 1975-1976. The shortfall in generating capacity in relation to demand amounted at that time to 4,550 MW. The Council of Ministers therefore passed resolution No 204/75 on the expansion of the public-utility power industry. Unfortunately, this resolution remained on paper only.

Since this was paralleled by the fact that the targets set for the power industry under the terms of the resolution on the Five-Year Plan for 1976-1980, were not fulfilled, that, of a projected 8,100 MW, only 5,550 MW of generating capacity were brought on line, and that, at the same time, delays occurred in the construction of transmission power lines, the power deficit by as early as 1979 already amounted to 5,975 MW, whereas losses attributable to this deficit resulting from blackouts and so on were estimated at 100 billion zlotys.

There was only one way to break this impasse--the accelerated expansion of the power industry. Unfortunately, the general belief was that because of our large coal reserves the development of the power industry had to be based on the use of hard and brown coal as fuel. And notwithstanding the fact that experts were pointing out all of the risks resulting from these kinds of decisions, the coal-energy lobby prevailed.

Improvised Planning

However, realizing that this was indeed a difficult situation, power engineers did not give up on their plans for the construction of nuclear power plants. Numerous plans and studies were drawn up, but, unfortunately, they were carefully tucked away into the drawers of government ministries. At the same time though, a large number of people at that time went off to the west to do practicums in power plants already in operation or under construction. These were not always the same experts who later were supposed to make a contribution to the construction of power plants. But, after all, these were the 1970s. Our future nuclear engineers were being trained in the United States, even though everybody knew that, for a number of reasons, we would be buying our nuclear fuel and reactors in the USSR and that our construction crews were winning their spurs on the construction of the Khmelnitskiy Nuclear Power Plant. So, a lot of people took some interesting and profitable trips, the practical benefits of which at that time were virtually nil, even though it is certain that they learned a lot by doing so. A lot of money was spent and a lot of time was wasted, but in the final analysis the planning for the construction of Poland's first nuclear power plant in Zarnowiec is by any stretch of the imagination clearly reminiscent of the planning for the construction of the pulp and paper mill combine in Kwidzyn, a project which has become synonymous with wastefulness and bungling. At Zarnowiec too work on the construction of this nuclear power plant got started from the proverbial ground up, that is, to be precise from the actual power plant, forgetting altogether about peripheral services, including, inter alia, all of the other public and housing services that were needed. It goes without saying that this is going to have an impact on the progress of this costly capital project.

The construction of the Zarnowiec nuclear power plant was initially supposed to cost 75 billion zlotys (as measured in current prices). This would account for the two VVER-440 Soviet reactors which meet all of the standards set by the International Atomic Energy Agency. More than 40 such reactors are already in operation. The power plant is supposed to be equipped with four reactors and have a total generating capacity of around 1,800 MW. The

turbines will be manufactured in Poland at the "Zamech" plant in Elblag. Seventy percent of the equipment installed in this power plant is supposed to be made in Poland.

Seventy-five billion zlotys is a lot of money. However, this is not just a problem of costs, rather it is first and foremost a problem of the entirely new set of standards governing the construction process that we will have to deal with here. There can be no room here for delays, half finished work, or any of the other "everyday realities" of our construction industry. On this project we are playing for high stakes--the safety and performance efficiency of all of the power plant's systems. As was explained to me by engineer Jan Kubitt, the power industry minister's commissioner for nuclear power plant construction programs, "if it is written into the operating schedule that on a given day in some installation there are supposed to be 10 vibrators working on every cubic meter of concrete, then these vibrators have to be in operation where they are supposed to be. Not 9 vibrators one day and 11 the next, but no more or no less than 10!

"There is a reason why we are purchasing the construction scheduling system for the Zarnowiec power plant from the USSR. This is because, for the time being at least, we are not able to draw up such a system by ourselves, even though it is true that we have a vast amount of experience in the construction of conventional power plants. A nuclear power plant is something completely different, and this is something which, unfortunately, many people chipping their 2 cents worth into the construction of these plants do not appreciate very well, taking it for granted that somehow or other the job will get done. This way of looking at things cannot be tolerated on this construction project!"

I recently attended a number of different conferences connected with the construction of the Zarnowiec power plant, including, inter alia, a meeting of the executive board of the PZPR Gdansk Voivodship Committee, a plenum of the PZPR Municipal Committee in Wejherow, where the social services infrastructure for power plant workers are supposed to be built; I attended several meetings of people who are already working on this project, and I also interviewed a lot of people both at the actual construction site where they were operating earthmoving machinery and at the Ministry of Mining and the Power Industry. I was rather depressed by the things I heard said during these meetings. If the situation at this construction site and in areas supporting this project do not improve drastically, I am going to be very fearful for the future of the Polish nuclear power industry.

Zarnowiec is an experimental proving ground, a place where our specialists are going to win their spurs as builders and designers for the nuclear power industry. After Zarnowiec other nuclear power plants are going to come in line in the future with 1,000 MW reactors. This is another reason why this construction project is also so important from the standpoint of what is going to happen in the future.

At the Construction Site

The decision to build this nuclear power plant was made by the Council of Ministers on 18 January 1982. Also in January the minister of mining and the power industry made an operational decision designating the main parties to be involved work toward the completion of this project. The role of investor was assigned to the Northern Power Administration District in Bydgoszcz, the role of general engineer went to the ENERGOPROJEKT Power Industry Design Office in Warsaw, and the role of general contractor was awarded to the MEGAT enterprise in Warsaw; on 31 March 1982 the investor turned the site where the plant is to be built over to the general contractor, and the groundbreaking ceremonies were held on 2 May.

In all of the countries of the socialist camp the government is regarded as the general investor for these kinds of capital projects, while work on these projects is normally supervised by a government minister or even, as is the case in the USSR for example, by a vice-premier. In Poland the general investor is one of our power administration districts. In actual practice, then, this district power administration sends one of its officers to Zarnowiec to take charge of the project. Given the realities of our situation, this means that the investor is not in a position to take care of many of the important problems that arise on this kind of project. Thus, for example, more than a year has passed since work got started on this construction project, but it was not until late fall that the investor got around to designating a new contractor, ENERGOBLOK-Wybrzeze, instead of the former contract holder ENERGOPOL 6-Warszawa. The repair and maintenance shops in Gniewina, the workers dormitory in Nadole, and other facilities were in a state of drastic disrepair. The whole spring and summer were wasted when work could have been proceeding calmly on the refurbishing of these facilities. Now, in winter, workers from ENERGOBLOK are on the job in workshops with broken windows, and they have to replace the glass themselves. Living conditions in the workers dormitory are almost too sad to talk about. Nor will I say anything here about the opinions of the seven farmers from the village of Kartoszyno whose lands are being used for the construction of this power plant and whom the investor has not yet been able to relocate to another designated area because no plans have been drawn up for the construction of farm buildings on the new land. So, for a year now these seven farms have been vegetating in the midst of huge trucks and bulldozers with the farmers praying to God for a quick end to their torment. There are many more such examples.

On the other hand, it should be added, that this is the same investor which did not do a very commendable job of passing the test of building a nearby peak-load, pumped-storage power plant. Not because the construction work was completed so far behind schedule, but rather because so many mistakes were made in the process.

General contractor arrangements are the number two problem. In keeping with past experience, the minister awarded the general contract to ENERGOBUDOWA in Warsaw. The point is that this centrally-managed corporation was broken up and replaced by an association of allied industries. None of the former

directors of this organization were carried over onto the management team of the new association. This says a lot about the people and relations which used to prevail in this organization. And then the ENERGOBUD Power Industry Construction and Export Sales Enterprise was formed. All of the managers from the former centralized corporation found jobs in this enterprise, and it was awarded the status of general contractor. At one of the workers meetings at Zarnowiec an operator had the following to say about them: "Who are these guys wandering around the construction site, spouting words of wisdom without having any idea what it is all about?"

This worker is not the only one to express such opinions. In a letter dated 22 October 1982 and addressed to the minister of mining and the power industry, Czeslaw Piotrkowski, the Gdansk voivoda, Mieczyslaw Cygan, wrote as follows: "This is to advise you, citizen minister, that I have issued an order denying the Power Industry Construction and Export Sales Enterprise ENERGOBUD-Warsaw permission to conduct business activities within the jurisdiction of Gdansk Voivodship. I believe that the appointment of an enterprise without any resources of its own to call on as general contractor for the construction of the Zarnowiec Nuclear Power Plant is not only inadvisable, but also totally inconsistent with the spirit of the economic reform. For its part, ENERGOBUD would be confined to the role of issuing orders and directives to firms hired to perform the actual construction work, and it might possibly also coordinate their respective efforts. In light of the economic reform act, which grants enterprises the right to exercise full autonomy in setting their own tasks and determining how these tasks are to be fulfilled, the role of ENERGOBUD would appear to be superfluous."

Take note also that the same kind of general directorate was in operation at Belchatow and wound up being at least a year behind schedule in bringing this power plant on line. Doing things this way means that there is a chance that a valid and useful initiative will be all for nought. That is to say, ENERGOBUD does have a very necessary role to play in this construction project, but not as a general contractor and enterprise with an organizational structure which is highly advantageous to its own employees, a feature that was bestowed on this firm by the former directors of the old corporation. Rather it should serve as a kind of construction project police force by making sure that the aforementioned 10 vibrators are put to work as a full complement and at the time when they are supposed to be in operation, by making sure that the progress of work on the construction of the entire power plant and all of its component elements is fully in line with the provisions of the operating schedule. For the time being though, the way things look now, this is quite impossible, since, according to what I heard from one high-ranking official in the Ministry of Mining and the Power Industry, "the people working for ENERGOBUD are administrators, but what they need there are professionals, nuclear power engineers."

The current general supplier, MEGADEX, is in an especially difficult position by having to work with this kind of investor and general contractor, since it faces enormous problems when it comes to meeting deadlines for the delivery of machinery and equipment which it has to manufacture with multiple lead times amounting to several years, in addition to the fact that as

de facto contractor for the power plant it is working without the support and assistance of the general contractor.

No Infrastructure

At the present time there are approximately 1,300 people working on the construction of Zarnowiec nuclear power plant, most of which are employed by the enterprise ENERGOBLOK-Wybrzeze. Many of them are superb specialists with a solid background acquired through all of the hard work they put in on the Belchatow power plant, the Dolna Odra power plant, and many other power generating facilities in Poland. These people are solid, tough-minded, and seasoned workers. When the construction program is in full swing by around 1988 a total of nearly 9,000 people will be working on this project. The first power generating unit is slated to go on line by 1989, and the last, fourth one will go into service in 1992. So, it is hard to take it for granted that over all these years the workers would consent to live under such temporary and primitive conditions. Even now, as was similarly the case during the construction of the Kwidzyn project, these people are being housed in surrounding villages and small towns. They are filling up resort hotels in Jastrzebia Gora, accommodations in Wladyslawowa, and every vacant room in Wejherow and Reda. In this respect nothing at all has been done to get ready for this major construction project.

At a recent employees meeting workers living under relatively good conditions at the hotel in Nadol complained that they drink a glass of tap water when they are getting ready to go off to work in the morning because the hotel management, none other than ENERGOBUD, could not manage to provide them with the facilities needed to ... make a cup of tea. The housing projects which are supposed to be built in Wejherow and Rumia so far exist only on paper. Lately there have even been problems with the paper. This is because it turned out that the chief engineer for the housing project took off for the FRG leaving behind empty desk drawers.

At a plenary meeting of the PZPR Municipal Committee in Wejherow the municipal committee secretary, Wladyslaw Korzeniowski, stated that, "the costs of auxiliary capital projects associated with the construction of the Zarnowiec nuclear power plant and sited within the city limits of Wejherow amount to 3.969 million zlotys as measured in 1982 prices. Of this total sum, 1.775 million are to be spent on housing construction, 865 million on public services, and 1,349 on auxiliary construction work." He went on to say that, "we might be further along than we are in planning for these capital projects were it not for the problems we are encountering in getting on with the task of finding sites for this construction...."

This is the ultimate in politeness. This is because the brutal truth is that in Wejherow, the headquarters of the construction work force employed in the construction of the Zarnowiec power plant, and not counting the Chopin housing project with its 324 apartments, which are in any event occupied by people not associated with the construction of the power plant, all of the other major capital projects dedicated to the construction of housing for workers who will be coming in to work on the plant's construction in the future have

been shelved. This is because, at this point, no decisions have as yet been made as to where this housing should be built. Everything, absolutely everything is still in the planning stages. They are still working on the drafting of a design-cost estimate, but, to top it all off, without a general land-use plan.

The latter problem has its consequences. Recently, when bulldozers and other equipment drove up to the construction site for a heating plant in Wejherow, it turned out that the site was occupied by a recently and legally constructed fox farm. And this is not an isolated example.

At this point I would also like to quote Leon Brancewicz, secretary of the PZPR Gdansk Voivodship Committee and a veteran director of various construction enterprises, who said the following at an extramural session of the Executive Board of the PZPR Voivodship Committee held in Zarnowiec: "We have learned some sad lessons from capital investment projects mandated by the national plan. There was Port Polnocny, the oil refinery, the modernization of shipyards, the pulp and paper mill in Kwidzyn, and when it was all over there were not enough resources for the construction of housing, schools, and shops. So, what we want to do is make sure that this major capital project, which is going to take several years to complete, is carefully planned in accordance with the rules and standards of civil engineering science."

11813
CSO: 5100/3012

NATION UNABLE TO PRODUCE PLUTONIUM, EXPERT SAYS

Nazare Alves Comment

PY080249 Sao Paulo O ESTADO DE SAO PAULO in Portugese 5 Feb 83 p 6

[From the Rio de Janeiro branch]

[Excerpts] "The Nuclear and Energy Research Institute, IPEN, does not have the recycling facilities to obtain plutonium, but merely a set of cells which allow the simulation of certain indispensible operations of the recycling procedure. Brazil will never have the atom bomb if it is up to IPEN's ability to produce plutonium and as long as the directives of the Brazilian Government concerning the peaceful use of nuclear energy are in effect."

This statement was made in Rio de Janeiro yesterday by Rex Nazare Alves, chairman of the National Nuclear Energy Commission, CNEN. Nazare Alves said that "if it started right now, it would take Brazil 12 years to install a unit for recycling irradiated elements (burn-out uranium) at the rate of some 300 tons per year." CNEN's chairman also made it clear that even if Brazil had a recycling unit, it would meet with severe difficulties to obtain the irradiated elements, because a nuclear powerplant with an output of 300 mw/hour (Angra-1 doubles this output) would yield only 30 tons of waste per year and commercially feasible recycling demands at least 300 tons per year. He pointed out that the WASHINGTON POST report according to which Brazil was getting ready to produce nuclear devices lacks any basis, especially in the technical field.

Rex Nazare believes that irradiated (burn-out) fuel elements "may even be sent back to the United States in the future, because Brazil does not know what to do with them. The nation has a great deal to do yet, before it can start thinking about recycling fuel elements." He stressed, however, that the irradiated fuel elements that IPEN has can be recycled pursuant to proper authorization of the United States and in keeping with the International Atomic Energy Agency safeguards.

Army Unmoved by Claims

PY080215 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 6 Feb 83 p 5

[From the Brasilia branch]

[Text] The WASHINGTON POST report that Brazil is developing the potential for manufacturing nuclear weapons by producing plutonium elicited few reactions among the Army. Certain officers feel that it is normal for Brazilian scientists to be able to produce plutonium. In any case, they believe that this hardly means that the nation is manufacturing the atom bomb because Brazil follows a "peaceful" policy.

CSO: 5100/2037

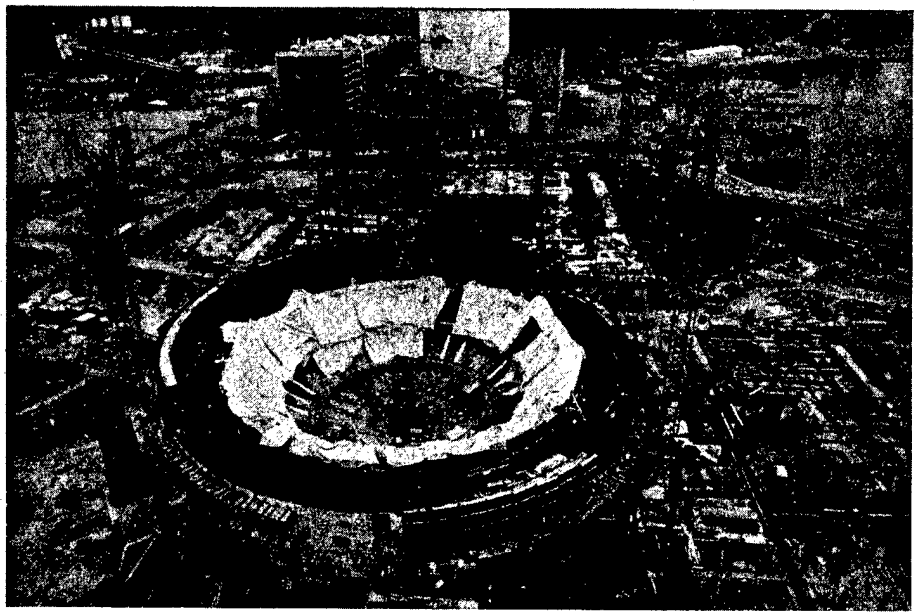
CUT IN NUCLEAR PROGRAM SEEN AS DEFEAT FOR SNI CHIEF

Sao Paulo VEJA in Portuguese 19 Jan 83 pp 72, 73

[Text] The straitjacket of containment of state spending was finally strapped on the Brazilian nuclear program, the fruit of the agreements signed in 1975 between Brazil and Germany. Pressured by the dramatic economic situation of the country, President Joao Figueiredo last week decided to practically freeze the controversial bundle of projects which would have given Brazil eight nuclear powerplants by 1990. After suspending construction of the Iguape 1 and 2 nuclear powerplants to be built in the municipality of Peruibe on the coast of Sao Paulo state, for an indefinite period, Figueiredo decided to delay the work on the Angra 2 and 3 nuclear powerplants on the Rio de Janeiro State coast. The decision, in addition to its impact on the country's accounts, also has an important political significance. It represents a defeat for Minister Octavio Medeiros, chief of the National Intelligence Service [SNI], and his political group--who had become the main advocates of the nuclear program in the present government.

The defeat of the intelligence community, on the other hand, is a victory for Minister of Planning Delfim Netto, the most articulate advocate, together with Figueiredo, of the idea of reining in the program. If it is necessary to reduce public spending, argues Delfim, there is no area in which greater economies can be made with less prejudice to the country than in the nuclear powerplants. It was on that question that the differences which arose recently between the two ministers, whose relationship have traditionally been good, have been centered. Once the decision was made by Figueiredo, however, the question disappeared and it apparently made the squabble between the two disappear also. It is probable now that the problem will delay in appearing again. When he vetoed the initiative of the Sao Paulo powerplants, Figueiredo did not give the irresistible metabolism of that type of undertaking a chance to get into movement. Once the first piling is driven, there appear all possible pressures and arguments to prevent the work from ever coming to a halt. Similarly, the delay of a year in Angra 2 and 3 may mean considerably more than that. Public projects normally drag along and the official decision to drag them out could mean the delay could become greater.

Last Thursday, NUCLEBRAS [Brazilian Nuclear Corporations] President Paulo Nogueira Batista sent a circular to the 6,500 employees of the state company charged with administering the program, explaining the budgetary cuts but promising he would dismiss the smallest number of employees possible. Therefore, it is very possible that the NUCLEBRAS payroll, which today reaches 10 billion cruzeiros annually, will remain without significant changes for some time yet.



Work will continue, but at a slower pace

Cutting the Fat

The Intelligence Community, which provided the political fuel for the nuclear program and systematically opposed attempts to bring it under control, resisted the freeze imposed by Figueiredo as much as it could. As far as the SNI is concerned, the need Brazil has to have access to learning the uranium cycle--which would make the possible construction of nuclear devices a reality--should be viewed as the national medium-range objective. All weapons were used for the preservation of NUCLEBRAS and its nuclear powerplant construction program. In the first phase, this confrontation occurred between the directors of the state company and the bureaucrats of SEST [Special State Company Oversight Secretariat], which is headed by Economist Nelson Mortada and subordinated to Delfim. The minister, via SEST, wanted to eliminate fat from the nuclear plan, reducing it to its most simple common denominator. After all, argued Delfim, there was a surplus of power and the problems with the pioneer powerplant, Angra 1--built outside the nuclear program at a cost 14 times that of the initial estimate and up to now not yet operational--counseled the greatest curb possible.

In the next round, Nogueira Batista sought support in the Intelligence Community. After all, argued the "nucleocrats," the execution of programs could not be interrupted without a significant prejudice to the transfer of sensitive technology from Germany to Brazil. Several spinoffs of the nuclear program--a veritable sheaf of subprojects, each of them managed by a NUCLEBRAS subsidiary--would simply become uneconomical if at least four nuclear powerplants were not built. Medeiros expounded this position to Delfim, seeking to neutralize the budget cuts, but he found him immovable. The subject then had to be brought to the attention of Figueiredo, who would have the final say, and in the presidential office the victory went to Delfim.

Alternatives of the KWU

In Germany, the KWU Company which manufactured the equipment that was to be installed in the future nuclear powerplants, was preparing for the worst. Armed with the reports from its representative in Brazil, Wolfgang Breyer, the company, which in 1979 saw the ambitious and multibillion nuclear program of Iran vanish from one day to the next--Iran was its most important customer--began to prepare alternative scenarios for its activities in Brazil. The worst case would be the total freeze of the program, with the halting of even the Angra 2 and 3 projects.

An intermediate picture prevailed in which the projects in Angra dos Reis continue, albeit at a slower pace, and those of Iguape are halted. In Rio, Breyer made it a point of explaining the situation of the company he represents: "The KWU at no time conditions the transfer of technology to the number of nuclear powerplants that are built." He emphasizes: "The fact is that there is a reality: One learns by doing."

Single Commitment

In the impressive headquarters of NUCLEBRAS in the center of Rio de Janeiro at the side of the Brazilian Academy of Letters, Nogueira Batista last week refused to make any major comments on the budget cuts he suffered. The company, which thought it had an approved budget of 415 billion cruzeiros, was left with only 300 billion, of which 173 billion are for investments. In the plan proposed to the SEPLAN [Secretariat of Planning], NUCLEBRAS was to have continued the construction of Angra 2 and 3, continued with the installation of the first stage of the uranium enrichment plant in Resende, begun the construction of Iguape 1 and 2, and installed a pilot plant at the uranium mine at Itataia in Ceara.

One unknown is the fate of the oversized NUCLEP [NUCLEBRAS Heavy Equipment, Inc], the subsidiary responsible for the construction of heavy equipment and prepared for manufacturing a complete nuclear powerplant per year. In the freezing of the program there remains one large account: between 1975 and 1982 $3 billion were spent and foreign loans were obtained in the amount of $1.2 billion, half of which were for helping to improve the balance of payments.

8908
CSO: 5100/2034

GOVERNMENT CONTROL OF NUCLEAR RESEARCH CRITICIZED

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 22 Jan 83 p 3

[Text] The president of the Brazilian Physics Society, Moyses Nussenzveig, in a press interview yesterday, criticized Decree Law No 1,982, which establishes control by the federal government of all research activities in the field of nuclear energy, saying the measure violates university autonomy and freedom of research and asking that the aforementioned decree, now under consideration in the National Congress, be revoked or substantially modified.

The president of ANDES [National Association of Higher Education Teachers], Luiz Pinguelli Rosa, declares that in the extreme limits of its application Decree-Law No 1,982 covers practically all departments, centers or units of universities which have basic research groups in atomic, nuclear, and elementary particle physics, radiochemistry and even those who use or develop nuclear techniques such as biophysics, medicine and several branches of engineering.

Professor Nussenzveig demonstrates that pursuant to the decree all processes of research in the field of nuclear energy may be carried out through agreements with the National Nuclear Energy Commission [CNEN], NUCLEBRAS [Brazilian Nuclear Corporations] or its subsidiaries. These activities will have the supervision and surveillance of both agencies and any agency or entity constituted for performing research in the field of nuclear energy must be managed technically and administratively by the CNEN, NUCLEBRAS or its subsidiaries.

The physicist believes the all-encompassing manner in which the articles of the decree were written worries the scientific and university community, openly violating university autonomy as well as the academic freedom of research necessary for creative activities in science and technology. It is not a matter here of questioning the monopoly exercised by the Union in the field of peaceful applications of nuclear energy nor the need for control and supervision by the CNEN over radioactive materials which may pose dangers to the people.

Professor Nussenzweig points to the present situation of the IPEN [Nuclear and Energy Research Institute], which went under the total and absolute control, including technically and administratively, of the CNEN, also stating that NUCLEBRAS is a company which is associated with several foreign groups and should not have the right to supervise and maintain surveillance over university research.

In turn, the ANDES sent a document to the minister of education so that she may take action within the framework of the Executive Branch for revoking the decree-law which establishes foreign interference within the sphere of authority of the Ministry of Education and Culture.

8908
CSO: 5100/2034

BRIEFS

URANIUM CONCENTRATE TO FRANCE--Sao Paulo--Without great problems, and after waiting 21 days to be shipped at Santos--during which time it caused many controversies--the new load of concentrated uranium exported by NUCLEBRAS [Brazilian Nuclear Corporations] is en route to the port of Sete, France, where it will be enriched. The shipment was made the night before last under the escort of civilian security agents of CODESP [Docas Company of Sao Paulo], the presence of physicist Ademir Guarnieri and many bystanders. The seven containers with 121 tons of uranium concentrate shipped aboard the ship "Lloyd Liverpool," received special attention by CODESP, which provided the replacement for the winch cables to prevent a possible break. All that, however, was not enough to satisfy the stevedores. At the end of the loading, the secretary of the Stevedores Union, Jorge Laranjeiras, complained that the operation was carried out at the same time as the loading of coffee and that NUCLEBRAS had not provided the safety masks it had promised. Moreover, a group of residents near the container storage facility of Lloydbrati, where radioactive material awaits shipment, yesterday held a demonstration in front of the Santos Prefecture. They complain, not only of the potential danger to which they are subjected, but also of the excessive noise the company makes in moving the cargo containers, even during the night. [Text] [Rio de Janeiro JORNAL DO BRASIL in Portuguese 21 Jan 83 p 21] 8908

NOGUEIRA BATISTA DENIAL--The president of NUCLEBRAS [Brazilian Nuclear Corporations], Paulo Nogueira Batista, denied yesterday that he is leaving the leadership of the organization. Laughingly, he replied to the question in the following manner: "That report is not true. I am not leaving NUCLEBRAS." Nogueira Batista went to the Rio de Janeiro International Airport to take his daughter, his mother-in-law and grandson, who were leaving for Europe on a vacation. He said the cuts ordered by the government in the nuclear program were "necessary" for adapting it to the present economic difficulties of the country. "We shall make the cuts very carefully so as to preserve the technical store of knowledge the enterprise has accumulated," declared Nogueira Batista. The President of NUCLEBRAS said that if the need arose, there could be some cuts in personnel in the organization. "However, they will be few so that their social impact will be small," said Nogueira Batista. [Text] [Rio de Janeiro O GLOBO in Portuguese 23 Jan 83 p 31] 8908

GERMAN REMARKS ON DELAYS--Brasilia (O GLOBO)--The German Government does not view the delays in the nuclear program with joy but it understands perfectly the need the Brazilian Government has for establishing priorities in spending, said the press attache of the German Embassy, Gunter Schutze, yesterday with respect to the government decision to delay the work of the Angra II and Angra III nuclear powerplants for one more year. As far as the German Government is concerned, the preservation of the basic principles of the agreement with Germany, as is assured by the Brazilian Government, is much more important than the stict compliance with timetables, although because of the economic crisis the completion of the work within the scheduled periods becomes almost impossible. According to Schutze, the German Government is convinced that as soon as the economic conditions of Brazil allow--which also depends on the recovery of the world economy--the nuclear program will be undertaken again without changes in its basic lines. Gunter Schutze said that for German industry the delay in the timetable of Angra II and Angra III is no great problem because orders have already been placed, the equipment is in the final stage of manufacture and, as far as is known, the system of payments will undergo no changes. With respect to the halt in the projects of Iguape I and Iguape II, there will be no problems either. [Text] [Rio de Janeiro O GLOBO in Portuguese 13 Jan 83 p 22] 8908

FINAL COSTS COULD INCREASE--Wolfgang Bryer, spokesman for the German company KWU, said yesterday the company fully understands the need for Brazil to set new dates for the conclusion of the construction work of the Angra II and Angra III powerplants because of its present international financial difficulties. He warns, however, the delay could increase the final cost of the project and affect private Brazilian companies which entered into the nuclear program counting on orders, and who invested heavily in the training of personnel and in the expansion of the production installations. Wolfgang Bryer also said the KWU believes "it would be a fundamental mistake to believe that the transfer of technology would be done on one side and the construction of the powerplants would take place on the other, as if they were two different things done in parallel and only linked by contracts between Germany and Brazil. [Text] [Rio de Janeiro O GLOBO in Portuguese 13 Jan 83 p 22] 8908

NEW NUCLEBRAS PRESIDENT--Dario Gomes has been designated new president of the Brazilian Nuclear Corporation [Nuclebras] to replace Paulo Nogueira Batista. [Brasilia Domestic Service in Portuguese 2200 GMT 2 Feb 83 PY]

CSO: 5100/2037

PURCHASE OF BRITISH NUCLEAR REACTOR DENIED

PY222015 Paris AFP in Spanish 1517 GMT 22 Feb 83

[Text] Santiago, 22 Feb (AFP) -- The Chilean Nuclear Energy Commission [CCEN] denied today the purchase of a British reactor which, according to press reports released in London, will reportedly allow Chile to manufacture dozens of atomic bombs before the end of the century.

This sounds like science fiction, CCEN director Col Juan Mir stated, commenting on a report by the London daily THE NEW STATESMAN.

According to this newspaper, Chile will reportedly purchase a 300 mw Magnox reactor, in a secret operation which is reportedly supported by the government of Prime Minister Margaret Thatcher.

According to a decision made in 1979, Chile will check within 2 years whether it is economically feasible to purchase a nuclear power reactor, and only then will it consider the possibility of including a reactor in the national energy plans, Mir stated.

The country has two low-power reactors now, one of five megawatts and the other of 10 to 20 mw. The reactors are being used for scientific research and for the production of radioisotopes for use in medicine, industry and agriculture.

The first (La Reina) was sold 15 years ago by Great Britain, the country which continues to supply Chile with uranium. The other (Lo Aguirre), which has been operating for 9 years, was purchased from Spain, though the fuel it uses is from France.

According to the Anglo-Chilean agreement signed in 1968, which includes strict conditions, the cooperation which exists between the two countries only provides for the peaceful use of nuclear enegy, Colonel Mir stated.

Mir added that in September 1982 he visited Great Britain with CCEN Chairman Gen Herman Brady, and that during their visit they met with suppliers and toured the old bure (Bristol) plant where two Magnox reactors are operating.

During the visit it was made clear that the Chilean plans to install a power reactor will be reviewed only in 1985, and this decision was reaffirmed to two members of the British National Nuclear Corporation who visited Santiago at the beginning of the year to familiarize themselves with Chilean energy plans for the next decade, Mir added.

But there is no commitment at all between the British National Nuclear Corporation and Chile, the colonel stated.

CSO: 5100/2040

DEFENSE EXPERT'S PAPER ON NUCLEAR PROLIFERATION REPORTED

New Delhi PATRIOT in English 14 Jan 83 p 5

[Text]

New Delhi and Islamabad should establish a 'hot line' and strengthen communication links between the two countries to preclude a war by misunderstanding in the event of Pakistani nuclear facilities being knocked out by a third country, reports PTI quoting a defence expert.

Such a link is vital, if Israeli commandos strike at the nuclear installations at Kahuta, Islamabad and Multan and be mistaken for an attack by India, says Dr R R Subramanyan in his monograph "Nuclear proliferation in South Asia: security in the 1980's".

Published by the Strategic and Defence Studies Centre, Canberra, the document argues that Israel may destroy Pakistani facilities for making nuclear weapons by air raids as it did in the case of Osirak reactor, Baghdad.

Failure of the United States to prevent Pakistani acquisition of atomic weapons may force the Jewish State to adopt the strategic of "assertive disarmament", Dr Subramanyan says.

Dr Subramanyan, who is a research associate at the Institute for Defence Studies and Analyses New Delhi, point out that after Israel raided Osiraq, its representative at the United Nations informed Secretary General Kurt Waldheim that Pakistan was engaging in the production of nuclear weapons.

Israeli Prime Minister Menachem Begin has repeatedly said that a nuclear warhead anywhere in the Muslim world is a threat to Israeli security.

Dr Subramanyan also counts on the outside possibility that Soviet troops in Afghanistan may attempt to destroy Pakistani nuclear facilities.

Given the blow-hot blow-cold relationship the Pakistani military regime maintains with India any such raid may be attributed to India and trigger off retaliation, in the absence of well-knit communication links, Dr Subramanyan says.

Since India has relatively sophisticated space programme, it should initiate the setting up of a viable 'hot link' between the leadership in New Delhi and Islamabad, Dr Subramanayan suggests.

However, regional management of nuclear proliferation problem by India and Pakistan alone is not feasible as long as the US and the USSR coordinate their overall strategies for the Arabian Sea and the Persian Gulf with those supporting their interests in South Asia.

The security of South Asia in the 1980's cannot be separated from the security interests of the two superpowers in South-West Asia and the Persian Gulf, Dr Subramanyan concludes.

CSO: 5100/7053

'UNI' CORRESPONDENT VISITS POKHRAN A-BLAST SITE

New Delhi PATRIOT in English 17 Jan 83 p 7

[Text]

Nine years after the big event, the site of India's first atomic explosion near Pokharan, Rajasthan lies 'unmanned and unprotected'.

A UNI correspodent who recently visited the site situated about 20 km from Pokharan town saw no sign of life except stray crows and grazing goats.

The underground explosion which catapulted India to nuclear might made a huge crater about 60 feet in diameter. Nothing much remains of the telltale sighs barring huge rocks or boulders either dislodged or torn apart and thrown over by the explosion. Charred fragments of rocks and desert bush are scattered around a radius of 1 km from the crater.

The crater pit has a huge slab of concrete with iron rods jutting out. According to a Rajasthan Government official, the concrete slab formed the base upon which the nuclear device was detonated.

A thick layer of black dust envelopes the slopes which also have wide cracks resulting from the explosion. However there is no evidence of nuclear fallout.

Other Government sources said the nuclear fallout was minimal and immediately after the explosion, the site was cordoned off by army personnel till it was declared safe for inspection.

Today the site is accessible only to those who know its exact location. Visitors have to suddenly veer off from the highway leading to Pokharan town and direct their vehicles on a seven km-long narrow track that leads to the site. What strikes the visitor at once is the animals grazing peacefully in the vicinity of the crater.

A small signboard put up beside the crator warns the visitor in English, Hindi and Urdu that photographing the site is strictly prohibited. That is the only official indication that the site was where India's nuclear history commenced.

CSO: 5100/7054

BRIEFS

TUTICORIN PLANT 'OPERATIONAL'--New Delhi, Jan. 13--The "minor mishap" to the Tuticorin heavy water plant last month resulting from the bursting of the ammonia cracking tubes has been rectified and the plant is now operational, according to official sources here. The plant has, however, been shut down on account of the power cut imposed by the Tamil Nadu Electricity Board and the plant authorities have not yet been able to secure priority for power supply to the plant, it is stated. The designated capacity of the heavy water plant is 71.2 tonnes a year, but it had been functioning only at 50 percent of its capacity. The actual production for 1980 and 1981 and for the six months ended June 30, 1982 amounted to 27.18 tonnes. India imported 41 tonnes of heavy water in 1981 and 40 tonnes each in 1981 and 1982 from the Soviet Union. [Text] [Madras THE HINDU in English 14 Jan 83 p 1]

CSO: 5100/7052

KOEBERG TIGHTENS SECURITY

Johannesburg THE CITIZEN in English 27 Jan 83 p 14

[Text] SINCE December security measures at Koeberg have been intensified, and the degree of security has been brought to a level which would have been applicable only at the next stage in the commissioning of Koeberg.

This step follows on the recent sabotage attempt and the subsequent request by the Minister of Mineral and Energy Affairs, Mr P T C du Plessis, that existing security measures be investigated and re-evaluated thoroughly by Escom.

Apart from the stricter security measures, Escom has since December been investigating all aspects of security as well as the damage caused by the sabotage attempt.

A precise estimate of the extent to which the commissioning of the first unit has been delayed will be possible only after completion of this comprehensive investigation, which may take a considerable time.

A full report will be submitted to the Minister of Mineral and Energy Affairs as soon as the investigation has been concluded. The Minister will issue a statement in due course.

However, Escom once again gives the assurance that Koeberg will not be put into operation before the safety and security of the installation comply with the requirements set by the Atomic Energy Corporation and the Council for Nuclear Safety.

Escom's senior general manager, Mr I D van der Walt, said in Johannesburg on Tuesday that Escom has been building the Koeberg nuclear power station to the highest standards of safety during the past six years.

"We will not allow this setback to affect the safe operation of Koeberg in any way, even if it means a delay of several months. In its planning of new power stations Escom has made provision for possible delays, and thanks to the good progress made with the new coal-fired power stations in the Transvaal we do not expect the country to experience a shortage of electricity in 1983 and 1984."—Sapa.

CSO: 5100/17

BRIEFS

NUCLEAR POWER--NO decision to build additional nuclear power stations had been taken, the Minister of Mineral and Energy Affairs, Mr Pietie du Plessis, said. Replying to a question from Mr John Malcomess (PFP Port Elizabeth Central) he said: "At present the load growth in the coastal areas does not justify another nuclear power station. In the interior, nuclear power stations cannot possibly compete with coal-fired power stations as a result of the availability of relatively inexpensive coal and the higher capital cost of nuclear power stations. The position is, however, reviewed from time to time and load predictions indicate that nuclear power will have to make an important contribution to the generation of electricity towards the end of the century." [Text] [Johannesburg THE CITIZEN in English 5 Feb 83 p 4]

CSO: 5100/21

STUDY CLAIMS NORDIC COUNTRIES CAN MEET OWN URANIUM NEEDS

Copenhagen INFORMATION in Danish 22-23 Jan 83 p 4

[Text] The uranium in Greenland and Sweden can provide more energy than all the natural gas, coal and water power put together.

A maximum utilization of the uranium deposits in Sweden and Greenland could make the Nordic countries energy self-sufficient.

That appears from a report--"Nordic Energy, 2020"--published Friday by a task force working under Nordel, the Nordic Power Supply Advisory Commissions.

With maximum utilization, the uranium could provide as much energy as natural gas, coal and water power put together and if the five Nordic lands supplied their own energy, 50 percent of the energy resources would come from Sweden and 30 percent from Norway.

The task force, which was asked to evaluate total Nordic energy resources and to compare them with the anticipated energy needs in the year 2020, pointed out that positive results could be achieved if there is closer cooperation among these countries.

Among other things, it suggested building a stronger cooperative network between the countries and said we should think in "Nordic" instead of "national" terms when evaluating the production capacity of power plants. The report also said that plant cooperation should be expanded so that less water would be wasted in Norwegian and Swedish hydroelectric plants and that regional heating plants could be used to guarantee electricity supplies in periods when there is a water shortage.

A new task force appointed by Nordel is already at work reviewing existing power plants, the cooperative network, supply commitments and variations in electricity consumption in order to examine in more detail the possibilities for closer Nordic cooperation on electricity.

6578
CSO: 5100/2525

INCREASING PERCENTAGE OF POPULATION OPPOSES NUCLEAR POWER

Copenhagen BERLINGSKE TIDENDE in Danish 10 Jan 83 p 7

[Article by Asger Schultz, Director of Danish Gallup Institute]

[Text] Immediately following the nuclear accident at Three Mile Island in March 1979 there was a strong reaction among the Danish people. Before the accident about the same number of people supported and opposed the introduction of nuclear in Denmark (39 percent and 38 percent, respectively), while immediately following the accident an absolute majority opposed nuclear power (54 percent). Supporters of nuclear power dropped to 30 percent.

As time passed after the accident, opposition declined and in the summer of 1980 the figures were about the same as before the accident.

Since then, the opposition has increased steadily and the most recent survey, undertaken by the Gallup Institute in October 1982, shows that opposition among the people now is at least as great as immediately after the accident.

The survey asked a representative sampling of the adult Danish population including about 1,000 respondents the following question:

"Parliament has postponed a decision on the construction of nuclear power plants in Denmark until a sufficiently safe method is devised for storing the nuclear waste. When and if parliament concludes that the problem has been solved and decides to construct nuclear power plants, there may be a referendum on this issue. Would you vote for or against nuclear power in a referendum?"

The following table presents the results of the latest survey and, by way of comparison, results from previous surveys back to the last survey, taken in December 1978, before the Harrisburg accident:

	DEC 78 %	APR 79 %	JUN 79 %	SEP 79 %	JAN 80 %	JUN 80 %	FEB 81 %	MAR 82 %	OCT 82 %
Would vote for nuclear power	39	30	32	36	37	37	39	32	31
Would vote against nuclear power	38	54	51	46	44	41	47	51	56
Undecided	23	16	17	18	19	22	14	17	13
Total	100	100	100	100	100	100	100	100	100

Whatever the reason, since the summer of 1980 people have changed their minds slowly but steadily on the construction of nuclear power plants. Now there are almost twice as many opponents as supporters of nuclear power (56 percent and 31 percent, respective). If we disregard the somewhat fluctuating percentage of "undecided," we obtain the following figures:

	DEC 78 %	APR 79 %	JUN 79 %	SEP 79 %	Jan 80 %	JUN 80 %	FEB 81 %	MAR 82 %	OCT 82 %
Would vote for nuclear power	51	36	39	44	46	47	46	38	35
Would vote against nuclear power	49	64	61	56	54	53	54	62	65
Total	100	100	100	100	100	100	100	100	100

However you look at it, the situation is practically the same as in April 1979, immediately after the accident. Since we now know that possible future legislation will be followed by a referendum, we may say that parliamentary approval would not be confirmed by a referendum today. A clear absolute majority of voters participating in a referendum would reject legislation supporting nuclear power and this majority would easily exceed one third of all qualified voters.

9336
CSO: 5100/2545

BRIEFS

DECISION ON NUCLEAR POWER POSTPONED--Environmental Affairs Minister Chr. Christensen called the government's hope of reaching a decision on the introduction of nuclear power in Denmark in the spring of 1984 and then holding a popular referendum on the matter unrealistic. The two reports on waste storage and safety which the Environmental Agency must submit before this can happen are expected to be ready sometime during 1983. But Chr. Christensen no longer believes that the subsequent debate can be concluded in a couple of months. It is anticipated that the report on safety issues will be ready in the current quarter. The Danish Geological Survey Office recently issued a report that lent some support to the claims of the electric plants that nuclear waste can be stored safely in the Mors salt dome. This report will be included in the overall review of storage problems which should be released by the end of the year. [Text] [Copenhagen AKTUELT in Danish 24 Jan 83 p 10] 6578

CSO: 5100/2555

FACILITIES OF FRAMATOME PLANTS MAKING NUCLEAR EQUIPMENT

Plant Size, Activitites

Paris REVUE GENERALE NUCLEAIRE in French Nov-Dec 82 pp 510-513

[Excerpts] The magnitude of the nuclear equipment development program, its duration, and the standardization of materials are all factors favoring large-scale production.

It is therefore possible to give the suppliers long-term supply requirement programs so that they can organize their own production and make the necessary investments.

Without trying to prepare an exhaustive listing of the facilities available, we will give a brief list here of the main facilities. This will give an indication of the magnitude of the investments required for the nuclear program, the specific needs, and the requisite technical potential.

FRAMATOME's Plant at Creusot (for Tank Construction)

This plant, built in less than 2 years, has a capacity of eight tanks per year. It has been operational since August 1973.

This 10,000 m^2 facility now employs 500 people, and to date has produced 40 tanks. It can handle the construction of tanks for units up to 2,000 MWe.

In this facility tanks for both the 900 MWe and 1300 MWe reactors are built. Their respective weights are 260 tons and 320 tons, and their lid weights are 55 tons and 70 tons, respectively.

A building 205 meters in length and 38 meters in width, with cranes of 340 tons and 150 tons, 22 meters under the hook, is used for the operations of covering the internal surfaces of the rings, flanges, end plates, and caps of the tanks, along with the welding assembly and machining of the tanks.

These facilities have high-performance machining equipment, including:

a. two vertical lathes, one of which can handle machining jobs with diameters of 10 meters, and a load capacity of 350 tons;

b. two boring and milling machines with bit diameters of 380/250 mm, and a vertical stroke of 5.7 meters.

c. welding equipment: 600-ton turning equipment; 200 mt positioning equipment, frames;

d. thermal treatment equipment for the tanks;

e. control equipment including two linear accelerators of 8 MVe.

The Framatome Plant at Chalon-sur-Saone

This entirely new plant is used for steam generators, pressurizers, and improvements made in the tanks. It has a surface area of 33,000 m^2.

It began to operate at the end of 1975. Its equipment includes the following items:

1. Production and machining shops for the crossbar plates of the steam generators, including:

   a. oxycutting stations;

   b. a multibit drill with 12 bits;

   c. a vertical furnace 5 meters in diameter with a movable seat and electric copying device;

   d. crossbar plates broaching stations;

   e. trimming machine;

   f. steam generators tubing stations.

2. A shop that produces subsystems for the steam generators and pressurizers; it has lifting equipment of 125 tons and 350 tons, in addition to these items:

a. two boring and milling machines with digital control, a vertical stroke of 5.7 meters, and bits of 270/175 mm on a bench 34 meters long;

b. two deep drills with three bits for drilling tubular plates;

c. a vertical lathe 8 meters in diameter, with a vertical stroke of 4.5 meters; load capacity: 160 tons;

d. two "expansion" furnaces, one of which measures 16 x 10 x 10 meters, with a load capacity of 600 tons, for annealing the tanks and steam generators.

e. welding stations for rings, welding of tubes on tubular plates and turning equipment with a capacity up to 600 tons, Inconel covering of the tubular plates, and positioning devices with a capacity of up to 200 mt.

3. A shop for final assemblies, trials, and testing of heavy components, equipped with traveling cranes of 450 tons and 600 tons with:

   a boring and milling machine with a stroke of 18 meters, hydraulic testing stations for the tanks, final assembly stations for the tanks and steam generators, and finishing and shipping stations.

The Jeumont-Schneider Plants at Jeumont

Jeumont-Schneider has set up some specific facilities in its Jeumont plants to produce components for the primary motor pump units and the control rod cluster mechanisms.

1. A shop with an area of 4,500 m^2 for the production and testing of motor pump units began to operate in early 1976; its main features are:

   a. a machining shop for elements of the motor pump units with about 20 machine tools;

   b. a shop for the assembly of thermal barriers and pumps; it has six stations for assembling 900 MW and 1300 MW pumps, and two hydrostatic testing stands for pumps, operating at pressures under 260 bars;

c. a shop for assembling motors and testing the units with:

four stations for assembling motors;

three stations for testing the motor pump units at real pressure and temperature conditions (120 bars, 280°C), two for 900 MW units and one for 1300 MW units.

2. A shop producing tight connections for shafts with controled leakage for the pumps was recently set up; connections for the 900 MW and 1300 MW pumps are produced there.

In addition to a certain number of specialized machines for machining materials such as alumina, chromium carbide, and graphite, this facility has two stations for testing connections, at real operating conditions of 180 bars.

All this equipment has an annual capacity of 20 to 24 motor pump units, and 80 to 100 sealed connections a year.

3. A shop with an area of 2500 m^2 is used for producing and testing mechanisms to operate the control rod clusters. This facility, equipped to handle an annual capacity of 450 mechanisms, includes the following main features:

a. specialized machine tools, including four machines with digital control;

b. a clean shop for assembling mechanisms, meeting nuclear cleanliness requirements;

c. test facilities, such as:

a mechanism testing station operating at nominal temperature and pressure conditions;

two cold operation testing stations;

one hydrostatic testing station.

The Creusot-Loire Facility (Internal Equipment)

This equipment is produced in a 6,250 m^2 shop specially built by the Energy Division of Creusot-Loire at Creusot for this work (and also partly for the constructionof steam turbines for the nuclear program). The equipment includes the following:

a. a machining center with lathes, milling and drilling equipment, with digital control and six axes controled; its capacity is Ø 9.6 meters, load 300 tons;

b. a boring and milling machine with digital control, four axes controled, a vertical stroke of 3 meters and horizontal stroke of 9 meters;

c. a vertical lathe of Ø 6.5 meters; height under cross-piece 5 meters, with display along four axes;

d. a welding machine, Ø 5 meters; maximum load 200 tons;

e. five final equipment assembly stands.

The technical experience acquired by now is considerable. Some major study and testing programs have been conducted in recent years. At the same time, manufacturing, assembly, control, and testing procedures have been improved and refined.

The nuclear industry has now reached its maturity.

However, this effort must be continued if our industry is to maintain its position. For this reason a major research and development program concentrating on improvements and the creation of new products was begun several years ago.

An example of the application of this research and development application at Jeumont-Schneider is the very special effort being made on studies and testing facilities.

Beginning in 1977, a large group of engineers, technicians, and designers was given the responsibility of acquiring complete competence in the field of primary pumps and mechanisms so that new products could be developed.

The procedure followed has been to clearly identify any technical weaknesses of the present product and then the variants that could be explored, either to correct these weaknesses or to develop a product with greater long-term potential.

This program covered all these fields:

a. hydraulics (definition of the pump's hydraulic cell);

b. mechanics (study of structures, of the enclosure under pressure, of the line of shafting of the primary pumps);

c. thermal (cooling of pumps and mechanisms);

d. electrical (pump and other mechanism motors).

The various solutions considered were subjected to extensive technical and economic evaluations based on the use of high-performance test equipment, some of which is real-size equipment.

In passing we should mention the special preparation of a testing facility with a surface area of 800 m^2, which has two test circuits for reduced-scale hydraulic models (scale: 0.4, installed power 800 kW), a test bench for motors for mechanisms (scale 1 and service temperature 260°C).

The research and development sections at Jeumont-Schneider are making use of the testing done in the various test circuits including:

a. The SUPER-BEC circuit of the CEA [Atomic Energy Commission];

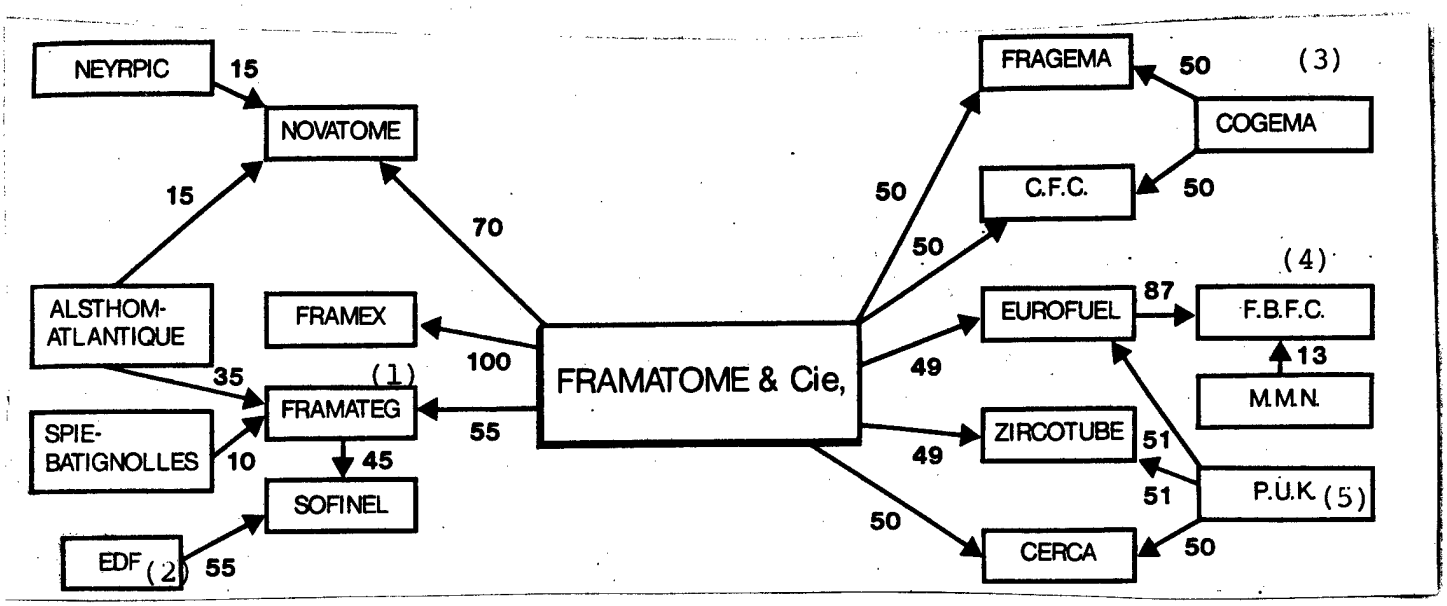
b. Jeumont-Schneider's hydraulic test circuit facility for reduced-scale models;

c. EDF's [French Electricity Company] test circuit for pumps operating at full flow capacity.

FRAMATOME Subsidiaries

Paris REVUE GENERALE NUCLEAIRE in French Nov-Dec 82 p 507

[Excerpts] FRAMATOME's Major Subsidiaries and Industrial Participations



Key:

1. FRAMATOME-Alsthom-Atlantique General Enterprises
2. French Electricity Company
3. General Company for Nuclear Materials
4. Franco-Belgian Fuel Production Company
5. Pechiney-Ugine-Kuhlmann

7679
CSO: 5100/2551

FRAMATEG EXPORTS TURNKEY NUCLEAR PLANTS

Paris REVUE GENERALE NUCLEAIRE in French Nov-Dec 82 pp 513-515

/Excerpts/ In order to handle the specialty of developing "turnkey" nuclear power plants for export, FRAMATOME /French-American Atomic Construction Company/ and Alsthom-Atlantique established a joint subsidiary: FRAMATEG /Framatome-Alsthom Atlantique General Enterprises/. This subsidiary handles the development of complete projects for export. Technical coordination is handled by SOFINEL (55 percent controled by EDF /French Electricity Company/,45 percent by FRAMATEG). The Koeberg and Karun contracts clearly illustrate FRAMATEG's role in handling these major export projects.

Among the nuclear power plants of the PWR /Pressurized Water Reactor/ type for which French industry has received export orders, two of them were "turnkey" contracts. These are:

a. the Koeberg power plant in South Africa;

b. the Karun plant in Iran.

I General Characteristics of the Two Plants

In both cases, these are plants with two 900MW units, which are practically identical to the ones built by EDF in France under the first program-contract.

There are, however, some technical differences in relation to the reference plant (Tricastin) and between the two projects themselves. These differences are derived primarily from the adaptation of the plants to meet local conditions, and affect such areas as:

a. cooling: ocean water is used at Koeberg, and river water at Karun.

b. climate conditions;

c. seismic conditions: Seismic activity is much more significant than in France.

Moreover, although the units are the same and the two contracts are similar, there are some major differences between the two jobs:

a. For Koeberg, the contract covers the actual power plant itself. Some related facilities, such as civil engineering for the pumping station and the high voltage station, were not included in the contract.

b. For Karun, the contract was much broader, and included a search for the site, extensive personnel training, and all general logistics, such as personnel housing at the site.

II Project Organization

These two projects were handled by closely related groups of companies, the same in both instances: Framatome, Alsthom-Atlantique, SPIE-Batignolles, and FRAMATEG (see the following table).

Koeberg and Karun Projects: General Organization of Work

FRAMATEG	FRAMATOME	ALSTHOM-ATLANTIQUE	SPIE-Batignolles
general project management; overall technical coordination; site management; personnel training; management of tests	nuclear segment: engineering; supplies; transport; assembly; start of service	conventional segment: electricity; engineering; supplies; transport; assembly; start of service	civil engineering; timbering; containment enclosure; off-site systems; studies; development.

FRAMATEG's Role

To handle the specific nature of the development of "turnkey" power plants for export, Framatome and Alsthom-Atlantique, about 7 years ago, established a joint subsidiary, FRAMATEG, which signs the contracts involved in the development of complete projects for export.

FRAMATEG, acting as the responsible party, handles the general commercial, financial, and contractual arrangements for the contract, dealing with the client, the French and local authorities, and members of the group.

FRAMATEG turned the technical coordination of the project over to SOFINEL (55 percent EDF; 45 percent FRAMATEG). This coordination includes:

a. the general studies required for the construction of the "turnkey" plant;

b. coordination of studies (standardization, interfaces, etc.);

c. assistance with the coordination of construction at the site;

d. the general organization of testing and the start of service of the plant.

III Background of the Contract

The Koeberg Contract

After an international invitation for bids was issued by ESCOM (Electricity Supply Commission) in early 1974 for the construction of a nuclear power plant at the Koeberg site, the French nuclear power industry, led by Framatome, in May 1974 set up a group of enterprises (Framatome, Alsthom-Atlantique, and SPIE-Batignolles) in order to submit a joint proposal.

A final revision of the proposal submitted to the client on 28 November 1975 led the client to issue a letter of intent (24 May 1976), followed by the letter dated 28 May 1976, setting the conditions for the execution of the contract, and fixing the date for starting work at 31 May 1976.

The program established in the contract has been respected. The first unit was to be connected to the power system at the end of 1982, and unit 2 is to be connected at the end of 1983. The fact that the French group has been able to respect the schedule (about 77 months) for the first unit is something that should be emphasized, especially in the difficult context of an export project for a client unfamiliar with French methods. This

performance demonstrates the maturity of the French companies involved and their ability to organize in order to handle contractual and industrial situations different from those existing in France.

7679
CSO: 5100/2551

VALLOUREC'S NUCLEAR TUBING EXPORTS, PRODUCTION CAPACITY

Paris REVUE GENERALE NUCLEAIRE in French Nov-Dec 82 pp 523-524

[Excerpts] Paralleling the development of the French nuclear power program, Vallourec has engaged in a very large investment program to meet the demand created for its equipment. Four of its major products are described here. For each of them, a specific, modern plant was set up, and is now in full production. These products are: steam generator tubing, water heater tubing, condenser tubes, and fuel cladding tubes.

After getting its nuclear experience starting in 1950 with the graphite-gas process, France in 1970 chose the PWR [Pressurized Water Reactor] process, using a Westinghouse license with FRAMATOME [French-American Atomic Construction Company] handling development. With the start of its "multiyear contracts" in 1973, calling for over 50 PWR reactors, EDF [French Electricity Company] has now become, by far, the biggest investor in nuclear power in the world.

This presented an opportunity for French industry, and Vallourec did not hesitate to grasp it.

In addition to this basic program, there have been other developments whose interest for Vallourec is quite large: fast neutron power plants and related facilities for isotope separation, fuel preparation, and radioactive waste treatment plants. The first fast neutron plant on an industrial scale, the Super-Phenix (1200 MW) is now at an advanced phase of construction.

I Vallourec's Policy

Ever since the start of its activities, Vallourec has been interested in the energy market and its equipment has gradually developed to meet the demand created by this market.

At the time when a nuclear market, and even better, a national nuclear market, was growing--in a way we hardly dare term explosive!--Vallourec could not remain idle.

Even before EDF's decisions were made official policy, Vallourec began a major program of investments in human resources, research, and equipment, in order to give priority to this national demand. The company then decided to continue this effort in order to eventually play a significant role in the international market.

Vallourec has invested a total of 300 million francs in special equipment and plant facilities in a 5-year period.

II Vallourec's Nuclear Products

A nuclear power plant uses a great deal of tubing, exchangers, elbow tubes, end plates, and tubular accessories: all these products are made by Vallourec.

Four of its products deserve special attention. For each of them a special modern shop was built, and is now in full production.

A Steam Generator Tubing

The steam generator is one of the most critical elements of the nuclear plant system, both in a PWR reactor and in a fast neutron reactor.

In the French PWR reactors, these tubes are made of Inconel 600. They are approximately 25 meters long and have a U-shaped bend. For a 900-MW reactor, it takes 210 kilometers of these tubes, and for a 1300-MW reactor, 490 kilometers of tubing.

The Super-Phenix steam generators use 140 kilometers of Incoloy 800 tubes made in spirals with an 80-meter extension.

A special facility, opened in 1975, was built for these tubes. Its size is 340 m x 25 m and it can produce tubes up to an extended length of 36 meters. This facility was later expanded by the addition of a new area 240 meters x 22 meters, which certainly increases its capacity, but which is used mainly for the new improvements added to meet EDF's and Framatome's latest requirements in terms of cleanliness and expansion area. A

new vacuum thermal treatment furnace was installed, straight in length but with small central arches. Special handling equipment was added in order to maintain the best possible surface condition by avoiding any contact between the tubes.

B Welded Stainless Steel Tubing for Water Heaters

In 1976, in order to avoid pollution of the secondary fluid, EDF decided to replace the carbon steel and copper alloy hairpin bend tubes used until that time in low pressure heaters in its PWR plants with stainless steel tubes. A similar decision was then made for the separator-superheater units.

To meet this sudden and sharp upturn in demand for its welded stainless steel tubing, Vallourec built a new plant at Laumes, near Montbard, in record time. Its total surface area is 8,600 m^2 and it can produce tubes of up to 50 meters of extended length. This shop was designed so that it can be considerably expanded, if that should become necessary.

Since it was opened at the end of 1975, this shop has produced over 18,000 km of tubing, used in all of EDF's nuclear power plants. It has also done a good deal of work for plants in Italy, Belgium, South Africa, and Yugoslavia.

C Welded Titanium Tubes for Condensers

At the end of 1976, confronted with the sudden demand caused by EDF plants located along the seacoast, production began at a new specialized facility built by Vallourec, also in a record time, located near the stainless steel tubing plant at Laumes, which has just been discussed.

This shop produces straight tubes with lengths ranging up to 26 meters. To date it has produced over 14,000 km of tubing, including 830 km for each of EDF's first six plants located along the coast, as well as tubes for condensers in Italy, Belgium, and South Africa.

D Fuel Cladding Tubes

This cladding provides the first barrier between fission products and the cooling fluid. This indicates its importance, as well as the resulting manufacturing constraints.

Since the start of development of fast reactors, Vallourec has taken an interest in this cladding and in the stainless steel casings used for this type of reactor. These products have given excellent results, and now Vallourec supplies almost all of the French requirements for this product, and exports them to Germany, Belgium, Italy, and India as well.

7679
CSO: 5100/2551

DETAILS ON DRAMA, SERRES URANIUM FINDS

Athens TA NEA in Greek 31 Jan 83 p 3

/Text/ Kavala, 31 January, from our correspondent--The uranium deposits discovered in the mountainous "Perki" region of Drama and "Maramena" of Serres are considered of particular importance. The discovery comes within the context of exploratory work being conducted by teams of the Institute for Geological and Mineral Research in 30 regions of the country.

It is being said that the Drama uranium deposit must be a continuation of the "uranium-bearing source" of the well-known deposit that was discovered years ago at Dipotama Paranestion of Drama. Dozens of drillings at various depths have been carried out in this region, while radiometric tests of the deposits have been made and various other related testing work was conducted for the purpose of determining the "extent" of these deposits. It is estimated that the deposits are both economical and workable.

According to existing data provided by experts on the "Maramena" deposit, the deposit extends in two directions and includes the Vrondos area. It contains "uranium ore" that is located within "carbonaceous alumina" and in thin lignite veins. The most important factor that stresses the workability of the vein is that no explosive materials are need for extracting the uranium but merely excavation equipment.

5671
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PAPER CONCERNED OVER FRANCE'S USE OF SPENT SWEDISH N-FUEL

Stockholm DAGENS NYHETER in Swedish 8 Dec 82 p 2

[Editorial by Olle Alsen]

[Text] Erik Svenke who is head of Swedish Nuclear Fuel Supplies and the man behind the dispute reprocessing agreements with the French Cogema, believes, according to TT, that it is an unprecedented accusation to claim that France should be able to use plutonium from spent and reprocessed Swedish nuclear fuel to produce French nuclear weapons.

"The accusation means that France would break agreements which were made at a government level," says Svenke, "but that is inconceivable because 'there is of course a large international control system which France has accepted'."

In the year 1978 France as member of the London Club within IAEA, the International Atomic Energy Association, signed an agreement about more stringent security regulations to prevent the spreading of nuclear weapons through export of nuclear power technology. One idea of the London Club was just to brake France's too liberal, intentionally unbiased, export of such technology. The French tried, for one thing, to sell an enrichment installation to Pakistan and delivered a so-called Osiris reactor to Iraq, which the Israelis later on bombed as a potential plutonium producer for an "Arabic atomic bomb."

France has recently decided to sell enriched uranium--the other nuclear bomb fuel besides plutonium--to the Indian nuclear reactor in Tarapur. This obviously violates the London Club agreement. "But certainly not," say the French, "of course, we are only taking over an American-Indian contract from 1963, and according to that the rules of the London Club do not apply..."

Governments which can allow such quibbling are probably capable of setting themselves above international control systems when required in other connections too.

Energy Minister Birgitta Dahl has several times declared that no export of spent Swedish nuclear fuel will be permitted if there is any risk that the plutonium may be used for nuclear weapons. This is presumably a more serious obstacle for the export than even the poor maneuverability and the construction of the nuclear waste vessel "Sigyns"--according to the pilots and others--and the debacle about calling at a pier in the Barseback plant's inadequate harbor. And Svenke has understood this, so he tries to give a counter fire of indignation. Should France???!

8958
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PAPER COMMENTS ON SIGNIFICANCE OF SENDING SPENT FUEL TO FRANCE

Stockholm DAGENS NYHETER in Swedish 7 Jan 83 p 2

[Editorial by Olle Alsen]

[Text] The government now allows export of 57 tons of spent nuclear fuel in the first round to the French plutonium factory La Hague in spite of the fact that the Social Democrats--like the Center Party and VPK--are against reprocessing because it increases the risks of spreading nuclear weapons.

These 57 tons according to the so-called 70s agreement is not very much compared to the 670 tons which are covered by the 80s agreement, and that in turn is not very much compared to the additional approximately 6000 tons of nuclear fuel which will never be reprocessed and must be finally stored directly if the 12-reactor program is carried out.

Thus the reprocessing does not solve the Swedish waste problems. Also, the power companies would now prefer to get out of the contract, which will cost up to 5 billion (or twice that much according to calculations in the October issue of the French SCIENCE ET VIE) and causes reprocessed fuel to cost at least 5.5 ore per kilowatt hour for the entire waste handling as compared to approximately one-half without reprocessing.

The government defends itself by saying that they got into a difficult situation. Barseback 2 and next year Ringhals 2 had to be closed if the fuel was not removed from them. The reprocessing agreement cannot be broken now for then an additional four reactors would have to be closed according to the Condition Law, etc.

But this hard interpretation, in line with the interpretation of the People's Campaign, is here probably being used more as a threat and as a pretext. The government is still preparing a change in the Condition Law so that reactors can be operated even if the waste problems are not considered to be solved, which is the old irresponsible line of the Social Democrats. And within 2 to 3 years the central storage CLAB will be ready in Oskarshamn.

It should be possible to manage unloading the fuel inside Sweden with dense packaging and possibly transfer to available reactor basins until the new law is clear and CLAB can be utilized.

The government's decision would have been less threatening if it had been motivated only by the fact that some reactor elsewhere would have to be shut down for some time, no national catastrophe, and if it had been completed with some indication that the fuel actually only was to be stored in France and not reprocessed.

But unfortunately, Energy Minister Birgitta Dahl went considerably further in the direction of giving the entire hand to the nuclear potentate which now gets a first finger on the Swedish nuclear fuel (the reprocessing contract potentially covers a full 6 tons of plutonium. She said that if the more restricted conditions which the government obtained in the negotiations are satisfied--the only thing new seems to be a certain IAEA control--then the reprocessing contract will also be carried out. Because agreements which are made must be kept; anything else would be contrary to international law, and this is the basis for the entire Swedish peace work.

So there with the cat on the rat and the rat on the rope the end may be that it would be contrary to Swedish peace work to keep up to 6 tons of plutonium off the international market until the end by allowing neither export nor reprocessing.

Of course, the plutonium will be the property of the power companies. If it is not found to be economic or safe to mix plutonium into uranium fuel (so-called MOX fuel), and this will probably happen, what should we then do with the plutonium in Sweden? Sooner or later it will probably be sold to the French, who are hungry for reactor plutonium for running the breeder reactor Super-Phoenix, which will produce weapons-grade plutonium for possibly 2000 neutron bombs and 35-mile Hades missiles in the 1990s.

In December the nuclear vessel "Sigyn" ran aground in Barseback's Harbor and it was shown that it was not so seaworthy. In December the government received a meaty warning document about increased risks with reprocessing, etc., in France from Swedish Engineers Against Nuclear Weapons, with 800 members and names such as former head of FOA [Armed Forces Research Institute] Martin Fehrm and Sven Hellman from the Department of Defense in the administration. In December there were also news reports that the French so-called Castaing report, which was published on 10 January, warns about problems with the reprocessing and says that maybe it would have to be abandoned.

In spite of such extra reasons for the promised thorough re-evaluation of the export question, it seems to have gone through. Barseback 2 has to get rid of some fuel in March; thus Sweden must immediately take the first actual step which may lead to plutonium. Birgitta Dahl's promise never to permit export of Swedish nuclear fuel if it results in the least risk of spreading nuclear weapons was clearly not intended so seriously. Because agreements made must be kept first of all for the sake of international law.

8958
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GOVERNMENT GIVES GO AHEAD FOR SHIPPING N-FUEL TO FRANCE

Stockholm DAGENS NYHETER in Swedish 7 Jan 83 p 8

[Article: "Now It Is Decided. 'Sigyn' Will Sail "]

[Text] The government has now given the go ahead for exporting Swedish nuclear fuel waste to the La Hague reprocessing installation in France. The National [Swedish] Administration for Shipping and Navigation has at the same time reported that the ill-fated special vessel "Sigyn" is now considered to have met the requirements for safety at sea.

The government has had to take a position on export applications for a total of 112 tons of spent nuclear fuel, but the license applies only for 57 tons.

"We would prefer not to have any reprocessing at all, but the nuclear power industry has gone along with the nonsocialist government's decision about reprocessing as the only alternative," says Energy Minister Birgitta Dahl. "There are therefore very small possibilities for storing spent nuclear fuel at the nuclear power plants, and the preliminary storage place which is under construction will not be ready for a couple of years."

Agreement

If the nuclear power companies are not allowed to export nuclear fuel, one is forced to close Barseback 2 and Ringhals 3.

"The permission which the government has given is valid only for 57 tons. We have in no way taken any position on further reprocessing," says Birgitta Dahl. "We will now in the immediate future invite other parties in Parliament to discussions in order to get the greatest possible agreement on how the waste problem will be handled in the future."

According to the Energy Minister, the government has received 100 percent guarantees from Cogema and the French government that Sweden will have full control over the Swedish nuclear fuel waste.

8958
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REPORT GIVES STATISTICS ON CAPACITY USE OF NUCLEAR PLANTS

Stockholm DAGENS NYHETER in Swedish 5 Jan 83 pp 1, 5

[Excerpt] On Tuesday Sydkraft presented figures which show that Barseback's second reactor is one of the most efficient. Not only in Sweden but possibly of all 300 which are in operation all over the world.

So far not all data have been received, but it is already clear that Barseback 2 will be difficult to beat. It has namely been possible to utilize it up to 96 percent!

Last year it did not have to be shut down since because of modifications it was possible to go up to 18 months between regular inspections. This is how it now will be with Barseback 1 too, which was utilized up to 79 percent last year, when it was shut down for an inspection.

Oskarshamn 2, which is a reactor of the same construction as Barsebacks, reached 85 percent degree of utilization. Oskarshamn 1 had the percentage figure 76, Forsmark 1 70 and Forsmark 2 67. For Ringhals 1 71 percent were recorded, for Ringhals 2 65 percent and for troublesome Ringhals 3 only 16.

The average percentage was 66 for the utilization of all of Sweden's nuclear power reactors during last year.

The figures from Sydkraft also show that the consumption of electric power in the southernmost part of Sweden last year increased much more strongly than in the rest of Sweden. A 6 percent increase in Sydkraft's area (Skane, Halland, Smaland, and Blekinge) as compared to 2 percent increase in the rest of Sweden. The increase is due to the fact that many home owners abandoned oil and went over to electric power. Industry's demand for electric power, however, remained unchanged, which by itself is a bad omen.

Of the electric power which was used in the southernmost part of Sweden, 75 percent was produced in the nuclear power stations in Barseback and Oskarshamn, while 25 percent of the electricity came from hydroelectric power. The oil condensate power station in Karlshamn hardly had to be used at all last year due to the fact that the production of the nuclear power stations went so well.

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BRIEFS

POWER PRODUCTION OF NUCLEAR PLANTS--Reduced delivery of electric power from Ringhals in 1982. VARBERG (TT). The annual delivery to the electric grid from the nuclear power station Ringhals was somewhat less in 1982 than in 1981, namely 10.8 as compared 11.1 billion kilowatt hours (kWh). The reason is primarily problems with Ringhals 3, which delivered only 1.3 billion kWh during 1982 as compared with 2.9 during 1981. "1983 will hopefully be the year when all four blocks can be in full operation," says the head of Ringhals power station, Evert Ericsson. For Ringhals 1 and 2, 1982 was the best operating year so far with deliveries of 4.7 and 4.6 billion kWh, respectively, as compared to 4.1 for both reactors in 1981. Ringhals 3 and 4 have had low production due to vibration problems in the steam generators. Ringhals 4 has not yet been placed in commercial operation. [Text] [Stockholm SVENSKA DAGBLADET in Swedish 4 Jan 83 p 6] 8958

CSO: 5100/2543

TURKISH ATOMIC ENERGY COMMISSION ESTABLISHED

Ankara RESMI GAZETE in Turkish 13 Jul 82 pp 1-7

/Text of law as published in the official register/

/Text/ Turkish Atomic Energy Commission Law

Law No 2690, date: 9 July 1982

Part I

Purpose, Scope and Organization

Purpose

Article 1 — To define the organization, function, duties, powers and responsibilities of the Turkish Atomic Energy Commission in providing for the use of atomic energy in Turkey for peaceful purposes to the benefit of the nation in keeping with development plans, formulating and recommending basic principles and policies, and conducting, regulating, supporting, coordinating and supervising scientific, technical and administrative procedures.

Scope

Article 2 — This law covers the public agencies and natural and corporate persons engaged in and whose field of interest involves activities concerned with atomic energy.

Organization

Article 3 — The Turkish Atomic Energy Commission, abbreviated TAEC, is a public corporation attached to the Office of the Prime Minister for the purpose of performing the functions set forth in this law.

The organs of the agency are:

a) Atomic Energy Commission
b) Advisory Council
c) Specialized Offices
d) Subordinate Organizations

Part II

Duties, Powers and Responsibilities

Duties, Powers and Responsibilities

Article 4 -- The duties and powers of the Turkish Atomic Energy Commission are: a) to devise and present for the approval of the Prime Minister the principles of the national policy to be pursued in the use of atomic energy for peaceful purposes for the benefit of the nation and plans and programs in this regard; to perform and direct the performance of all research, development, investigation and studies to make possible the advantageous use of atomic energy in the scientific, technical and economic development of the country; to coordinate and encourage efforts to be made in this area.

b) To devise, make recommendations and ensure cooperation on the general principles to be applied in all matters such as exploration, extraction, purification, processing, production, distribution, importation, exportation, commerce, transport, use, transfer and storage conducted in connection with nuclear raw materials, fissionable materials and other nuclear-related strategic materials.

c) To establish or direct the establishment and operate or direct the operation of research and educational centers, units, laboratories, testing centers and pilot nonbreeder facilities in the appropriate locations in the country; to conduct studies on enabling national industry to embark on nuclear technology; to make proposals for the building of operations, purification and other facilities deemed necessary as regards fuel conversion.

d) To build and operate facilities for radioisotope production, quality control, standards and distribution;

To formulate principles and proposals providing for protection against harm by ionizing radiation in endeavors involving the use of radiation devices, radioactive materials, fissionable materials and similar ionizing radiation sources, and to set the legal limits of responsibility.

To issue enabling licenses to official and private agencies, organizations and individuals which keep, use, import and export, transport, store and trade in radioactive materials and radiation devices; to oversee the said agencies, organizations and individuals as to radiation safety; to set insurance obligations to apply in the performance of these duties; to revoke issued licenses temporarily or permanently in cases of violation of radiation safety regulations; to decide to shut down the said agencies and organizations if necessary and bring legal proceedings under the general principles of the law;

To prepare bylaws and directives for the use, import, export and transport of radioisotopes and the principles pertaining to insurance obligations.

e) To issue all permits, approvals and licenses concerned with the site selection, construction, operation and environmental safety of nuclear power

and research reactors and fuel conversion facilities; to conduct and exercise the necessary inspections and oversight and restrict operational authority in cases of noncompliance with permits and licenses; to revoke issued permits or licenses temporarily or permanently and recommend the shutdown of these facilities to the Prime Minister;

To prepare the technical regulations, bylaws and directives necessary for these purposes.

f) To take or direct the taking of measures necessary for the safe handling, transport and temporary or permanent storage of radioactive wastes from nuclear facilities and radioisotope laboratories.

g) To establish liaison and cooperation with national agencies and organizations concerned with atomic energy; to join the scientific endeavors of foreign and international agencies and organizations in the nuclear field and establish contacts and cooperate with similar organizations;

To decide the programs and distribution of aid to be obtained internally and or externally for nuclear endeavors of all kinds.

h) To train the personnel who will work in the nuclear program or assist in their training if necessary and cooperate with the organizations and institutions of higher learning working to this end; to make recommendations for the distribution of domestic scholarships in nuclear subjects; to assign distribution of scholarships originating abroad; to open or assist in the opening of courses within the country; to send students and personnel to foreign countries; to plan and follow up on the education and studies in which they will be engaged.

i) To collect, publish and publicize domestically and abroad the information and study results deemed necessary in connection with atomic energy technology; to inform the public of necessary information; to educate the public on nuclear matters.

j) To conduct studies of national and international law on nuclear matters and propose necessary revisions.

k) To prepare and implement bylaws and directives setting forth the principles relating to the protection of nuclear materials and facilities, oversee related matters and report the views of other organizations on guidelines they will draw up related thereto.

Part III

Organs, Duties and Powers

The Chairman of the Turkish Atomic Energy Commission

Article 5 -- The Chairman of the Turkish Atomic Energy Commission shall be selected by the Prime Minister from among scientists and specialists in the field and shall be appointed by joint decree.

The Commission Chairman shall ensure the performance of the duties assigned the agency under this law within the framework of the principles and programs set forth by the Atomic Energy Committee. He shall represent and direct the agency and is the agency's official for authorizing accounts.

Three vice chairmen shall be appointed by the rules and methods applicable to the chairman to assist the chairman of the Turkish Atomic Energy Commission in his endeavors.

The chairman shall assign a vice chairman as his deputy in his absence.

Atomic Energy Committee

Article 6 — a) Organization:

The Atomic Energy Committee, under the chairmanship of the chairman of the Turkish Atomic Energy Commission, shall consist of the vice chairman, one member each from the Ministries of National Defense, Foreign Affairs, and Energy and Natural Resources and four academic members to conduct nuclear training, education and research. Members representing the ministries and and institutions of higher learning shall be selected by the Prime Minister to serve a term of 4 years. Members may be reselected by the Prime Minister upon expiration of their terms. Should a membership be terminated prematurely for any reason, a new one shall be selected to complete the unexpired term.

The Prime Minister shall chair meetings of the Atomic Energy Committee so long as he shall deem it necessary.

Atomic Energy Committee meetings shall be attended by representatives of other ministries concerned therewith according to principles to be set forth by the Prime Minister.

b) Duties:

1. To devise the working principles and programs of the Turkish Atomic Energy Commission, to approve the draft budget and submit it to the Prime Minister.

2. To prepare and submit to the Office of the Prime Minister nuclear-related bills and bylaws and to approve directives related to the Turkish Atomic Energy Commission.

3. To monitor and evaluate the endeavors of the Turkish Atomic Energy Commission and prepare annual working programs and reports for submission to the Prime Minister.

4. To review the organization and staff of the commission vis-a-vis its developing needs and submit necessary revisions for the approval of the Prime Minister.

c) Modus Operandi:

The Atomic Energy Committee shall meet at least four times annually and the secretarial affairs of the Committee shall be conducted by the secretary of the Office of the Chairman of the Turkish Atomic Energy Commission.

A directive shall be issued detailing the modus operandi of the Atomic Energy Committee.

Advisory Council

Article 7 — The Advisory Council shall consist of members of academia employed in the nuclear field and experts in other related institutions and organizations whose number, qualifications and rules for selection shall be set forth in a directive. It shall meet by invitation. Advisory Council members shall be appointed upon the proposal of the Atomic Energy Committee and the approval of the Prime Minister. The council shall be summoned to meet at least once annually by the President of the Turkish Atomic Energy Commission. The Chairman of the Turkish Atomic Energy Commission shall chair the meeting.

The Advisory Council shall examine matters referred to it by the Atomic Energy Committee and shall report its conclusions and recommendations to the Atomic Energy Committee.

Experts from within the country and abroad may be invited to the Advisory Council and their ideas and opinions may be heard.

A directive to be prepared by the Atomic Energy Committee shall be issued detailing the modus operandi of the Advisory Council.

Specialized Offices, General Secretariat: Organization and Duties

Article 8 — The Turkish Atomic Energy Commission shall embody the Specialized Offices named below and a General Secretariat through which to perform the duties set forth in this law. Office Chiefs shall be appointed according to standard procedure from among scientists and specialists competent in their fields. The duties of these offices and general secretariat are:

a) Office of Nuclear Security:

Of those duties set forth in article 4 of this law: to perform those concerned with nuclear safety; to perform the duties related to site selection, construction, systems engineering, initiating service, operations and physical protection of nuclear facilities, as well as protection from radiation, nuclear materials security and oversight, environmental safety services and other related duties.

b) Office of Radiation Safety and Security:

Of those duties set forth in article 4 of this law: to perform the duties of formulating the statutes and principles governing licensing and protection from radiation, of the transport and storage of radioactive materials, of inspection services of radiation-emitting devices and systems and other related duties.

c) Office of Research-Development-Coordination:

Of those duties set forth in article 4 of this law: to conduct studies and projects on nuclear energy, perform services related to nuclear technology, radioisotope production, international relations, education, publication, public relations and translation services and other related duties.

d) Office of Technology:

Of those duties set forth in article 4 of this law: to conduct research on nuclear fuel conversion and nuclear raw materials as well as on nonbreeder reactors, to conduct services related to quality control, economic analysis and industrial relations and other related duties.

e) Office of Administrative and Financial Affairs

To conduct the personnel, internal affairs, general services and record-keeping and the construction, equipping, budget and comptrollership services set forth in this law and other related duties.

f) General Secretariat:

To perform the Commission's secretarial services and other duties.

Subordinate Organizations

Article 9 -- For the conduct of basic and practical nuclear research, research and educational centers, units, laboratories, test centers and nonbreeder pilot facilities may be established subordinate to the Turkish Atomic Energy Commission. The modus operandi of the subordinate organizations shall be set forth by directive.

Part IV

Miscellaneous Provisions

Environmental Safety

Article 10 -- The measures whose adoption is necessary for human and environmental protection from radiation in the course of performing the duties set forth in article 4 of this law shall be defined in a code to be prepared by the Turkish Atomic Energy Commission.

Protection of Nuclear Facilities

Article 11 -- The provisions of Law No 2495 of 22 July 1981 and Law No 2565 of 18 December 1981 shall apply in the physical protection of nuclear facilities.

Status of Personnel

Article 12 -- The provisions of State Civil Service Law No 657 shall apply to Turkish Atomic Energy Commission personnel.

The Commission's billets are shown in the attached table [not published].

Contract personnel may be employed with the approval of the Prime Minister and with the proviso of billet availability in the positions of Commission Chairman, Vice Chairman, Office Chief, General Secretary, Group Chief, Nuclear Research and Training Center Director and Deputy Director and Division Chief to be designated by the Atomic Energy Committee as well as other billets in the export and technical services category.

The provisions of the Republic of Turkey Retirement Fund Law No 5434 may apply at their request to contract personnel to be employed on the basis of billet availability.

Assignment of Other Organization Personnel to the Turkish Atomic Energy Commission.

Article 13 -- Commission and organization personnel covered by article 4 of Law No 160 of 13 December 1960 may be hired on the basis of the availability of the Turkish Atomic Energy Commission billets listed in paragraph 3 of article 12 of this law.

This assignment shall be made according to the provisions of the Turkish Armed Forces Personnel Law No 926 for members of the Turkish Armed Forces and according to the provisions of the Higher Education Law No 2547 for members of academia.

Other agency personnel may be placed on leave without pay from their own agencies and hired on contract. The period of time during which these personnel serve at the Turkish Atomic Energy Commission shall apply to their promotion and retirement status provided their deductions are paid by themselves and the equivalents are paid by the Turkish Atomic Energy Commission.

Wages to be paid by the Turkish Atomic Energy Commission to technical personnel receiving salaries from their own organizations and per diem to be paid per meeting to noncommission members attending meetings of the Atomic Energy Committee and Advisory Council shall be set upon the recommendation of the Atomic Energy Committee and the approval of the Prime Minister. The provisions of Per Diem Law No 6245 shall apply in hiring conducted by the agency.

Turkish Atomic Energy Commission Revenues

Article 14 — Turkish Atomic Energy Commission revenues shall derive from:

a) Turkish Atomic Energy Commission appropriations to be placed in the Prime Ministry annual budget,

b) All domestic and foreign assistance and donations and bequests made to the Turkish Atomic Energy Commission and accepted by the Commission,

c) Revenues from the production, distribution and sale of goods and services.

Any of these revenues not expended by the end of the record year shall revert to the Treasury.

Exemptions

Article 15 — a) The Turkish Atomic Energy Commission is empowered to make and conduct within the guidelines it will prepare any contract extending to future years for the performance of the duties assigned it by this law.

b) Turkish Atomic Energy Commission endeavors and all purchase, sale, repair and construction services it performs in direct relation to basic and practical nuclear research conducted at home and abroad in connection with implementation of the Atomic Energy Program shall be exempt from all taxes, duties, fees and shares and obligations in that it is not subject to the provisions of the Bid, Tender and Contract Law No 2490 and the General Fiscal Management Law No 1050.

c) Donations and assistance to the Commission are exempt from all taxes, duties and fees.

Oversight

Article 16 — The Turkish Atomic Energy Commission shall be under the supervision of the Supreme Control Council in administrative and financial matters. If the annual and interim reports of the Supreme Control Council call for the review of matters concerned with the Commission's administrative and fiscal procedures, the necessary audits shall be conducted by financial inspectors with the approval of the Prime Minister.

The Office of the Prime Minister shall convey report results to the judiciary if necessary.

The Turkish Atomic Energy Commission shall prepare a working report at the end of each year for submission to the Prime Minister.

Budget

Article 17 — The Turkish Atomic Energy Commission shall submit to the Prime Ministry the total appropriations required from the general budget to meet its program and expenses for each year.

Bylaws and Directives

Article 18 — The bylaws and directives specified in this law shall be prepared by the Turkish Atomic Energy Commission and shall enter in effect within 1 year at the latest of the date of publication of this law.

Directives to be prepared by the Turkish Atomic Energy Commission shall enter in effect following approval of the Prime minister.

Rescinded Laws

Article 19 — The laws which follow and the provisions of other laws which conflict with this law are rescinded.

a) Law No 6821 Pertaining to the Establishment of the Atomic Energy Committee,

b) Law No 7190 on the addition of a passage to paragraph (a) of article 2 of Law No 6821 Pertaining to the Establishment of the Atomic Energy Committee,

c) Law No 7256 Pertaining to the Implementation of the Turkish Atomic Energy Program,

d) Law No 234 on the amendment of paragraph (K) of article 2 of Law No 6821 Pertaining to the Establishment of the Atomic Energy Committee and the addition of an article and a provisional article to Law No 7256 Pertaining to Implementation of the Turkish Atomic Energy Program.

Provisional Articles

Provisional Article 1 — The members of the Atomic Energy Committee and Chairman and Vice Chairman of the Turkish Atomic Energy Commission whose establishment is envisaged by this law shall be appointed or hired within 2 months at the latest of the date of publication of this law. The existing organization of the Atomic Energy Committee established by Law No 6821 shall continue in force until completion of these appointments and hirings. The Atomic Energy Committee established by Law No 6821 shall be abolished upon completion of appointment and hiring and shall constitute the Turkish Atomic Energy Commission according to the provisions of this law. The assets and rights and obligations of the abolished Atomic Energy Committee shall devolve, free of all taxes and duties, upon the Turkish Atomic Energy Commission.

Provisional Article 2 — Adjustments for employees in worker or contract status held over from the present Atomic Energy Committee established by Law No 6821 shall, from the effective date of this law until the end of fiscal year 1982, be made without regard to the written application clause of provisional article 9 of Law No 2595.

If the net wages to be paid pursuant to the adjustment are less than the net wages prior to the adjustment, the difference shall be paid as due until such time as it is eliminated by wage increases.

Provisional Article 3 -- Appropriations placed in the budget for fiscal year 1982 for the services of the Atomic Energy Committee established by Law No 6821 shall be used by the Turkish Atomic Energy Commission.

Provisional Article 4 -- The provisions of existing bylaws and directives not in conflict with this law shall continue to be enforced until such time as the bylaws and directives set forth in this law shall enter into effect.

Promulgation

Article 20 -- This law shall enter in effect on the date of publication.

Enforcement

Article 21 -- The Council of Ministers shall enforce the provisions of this law.

12 July 1982

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CSO: 5100/4700

END